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MOTOR AGE





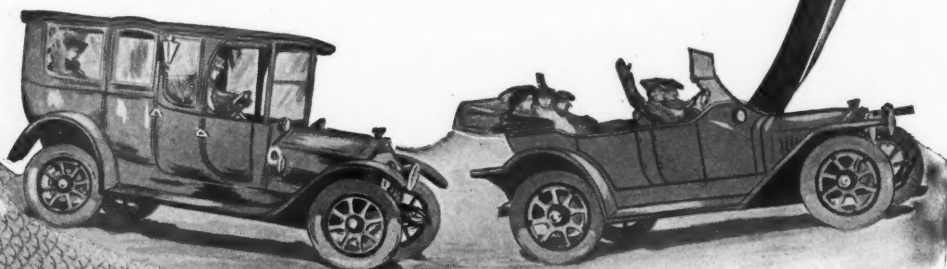
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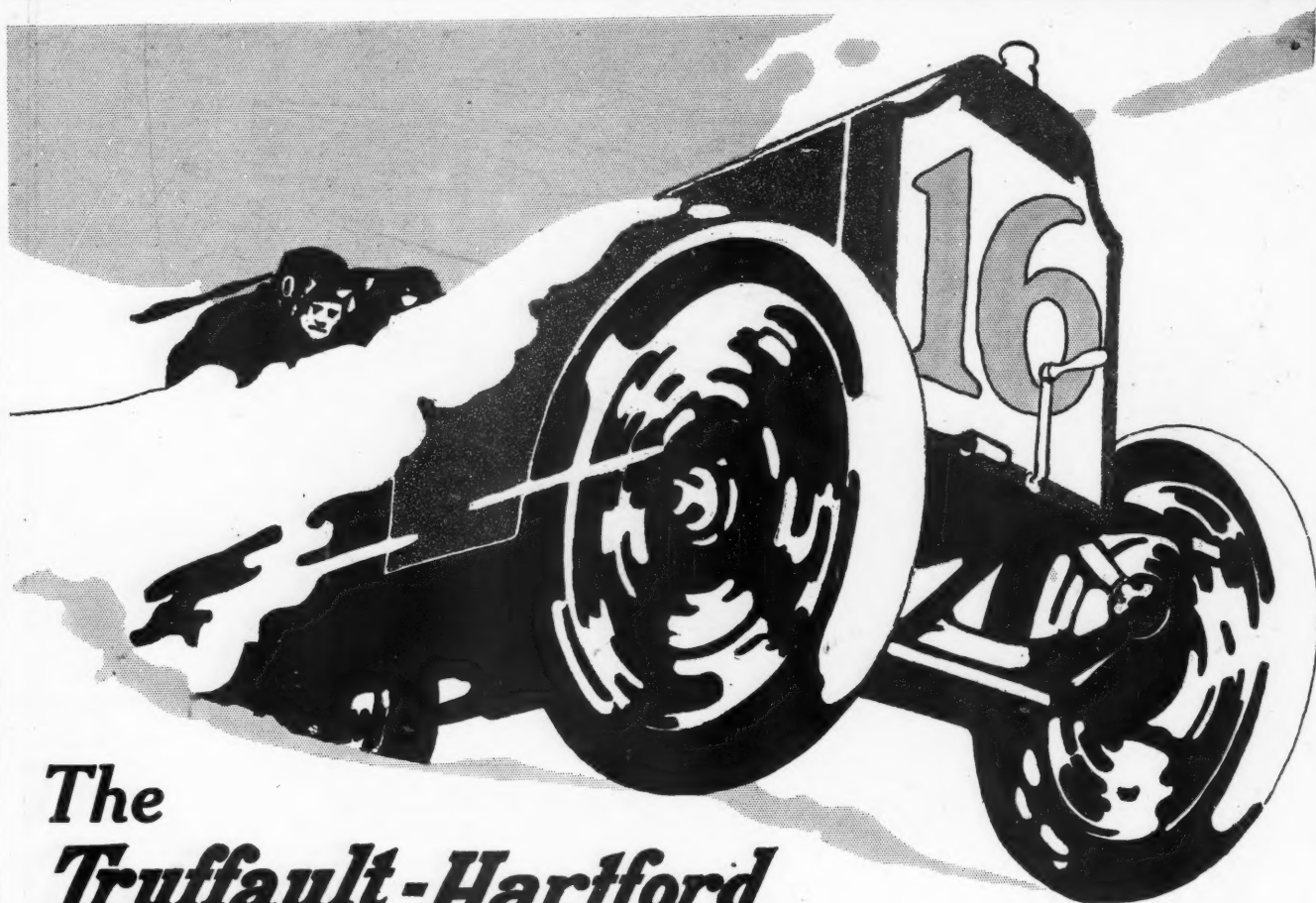
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MOTOR AGE



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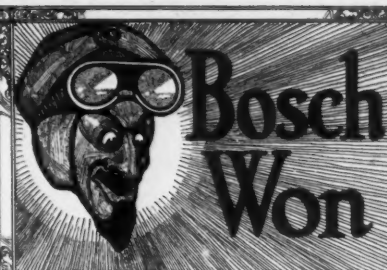
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The 500-Mile Race at Indianapolis

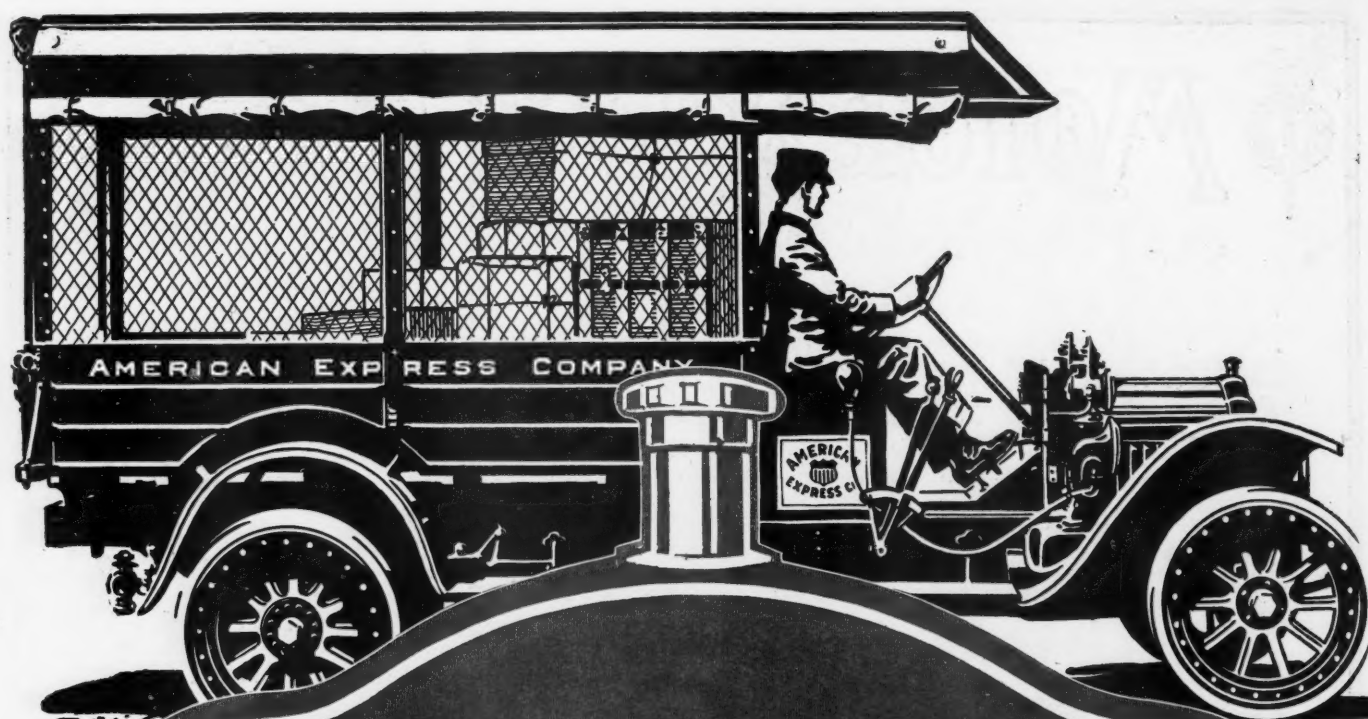
The winner and 11 out of 12 cars to finish used the Bosch Magneto. The speed was faster, the contest more difficult and the test more grilling than any other ever held, but Bosch proved equal to the requirements, of course.

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MOTOR AGE

Kentucky Says "Come"

The motorist seeking places quaint and unusual and wishing to visit historic spots will make no mistake in accepting the invitation of Kentucky. The bluegrass state is rich in scenic attractions and within its borders is one of the wonders of Nature, the Mammoth cave with a river, the Echo, that seems to be a tributary of the mythical Styx. Kentucky is also noted for her famous men—Daniel Boone, the frontiersman; Abraham Lincoln, America's immortal emancipator; Henry Clay, statesman extraordinary; Zachary Taylor, "Old Rough and Ready" of Mexican war fame and president of the United States; and Jefferson Davis, president of the Confederacy.

By Charles C. Swearingen

WHERE the moccasined feet of Daniel Boone trod noiselessly through the wilderness, where the barefooted Lincoln trudged through the forest to his labor, where the sweat-covered chargers of Morgan's mad raiders dashed during nights of red terror, there is now the hum of motors and the ancient trails of the Cherokees bear the imprints of pneumatic tires.

Kentucky, inspiration of orators and statesmen, theme of poets and dramatists, scene of Indian fighting and internecine

strife, again has been invaded by a mighty army, an army of wondering tourists who have been captivated by the scenic beauty and historic charm of the bluegrass state.

The Kentucky colonel—he has been immortalized in the drama—is a hospitable host. When you stop before his rambling mansion with its white-pillared porch, he slackens the dust of travel with a mint julep and bids you welcome. He escorts you over his broad estate, shows you his stable of thoroughbreds and insists that



Highest railroad bridge in the world over the Kentucky river, 21 miles from Lexington

you spend the night with him. Wise you are if you accept his invitation. For in the evening, when the blue southern skies are studded with stars, he will tell you stories of the long ago, stories that his great-grandfather told him, stories of Jeff Davis' wooing, of Henry Clay's campaigns, of Abe Lincoln's birthplace, of General Bragg's invasion.

Kentucky Popular With Motorists

That motorists who have adopted the slogan, "See America First," consider a visit to Kentucky, with its famed blue-grass section, its limestone macadam roads, its colonial farm mansions, its Mammoth Cave and its Lincoln Farm—the birthplace of Abraham Lincoln—well worth while and an important part of the program of gazing upon the wonders of nature in this country, is shown by the ever-increasing number of tourists from all parts of the country who visit that state and satisfy their desire to look upon beautiful scenery. The most discriminating motorist can spend weeks there and never tire of the going.

Among other points of interest, the tour-

Points of Interest in Louisville and Vicinity

Cherokee, Shawnee and Iroquois, three of the most beautiful parks in the country.

Falls of Ohio River.

George Rogers Clark buried in Cave Hill Cemetery. Clark homestead is only a few miles from Louisville.

Confederate Monument.

Statues of Henry Clay and Thomas Jefferson.

Daniel Boone Statue in Cherokee Park.

Tree in Iroquois Park where President Zachary Taylor carved his name.

Five miles from Louisville on Brownsboro road is located old home and farm of President Taylor.

ist will find the birthplace of Jefferson Davis—for Kentucky furnished both the president of the union and the president of the Confederacy—the home for years of Louis Phillippe, the exiled "king of the French," the home of Henry Clay, who might be called the "father of good roads in America," and the highest railroad bridge in the world.

No more delightful or interesting trip exists in the United States than that from Louisville to the Lincoln Farm by the Lincoln way, and the return to Louisville by the Central Lincoln road. Every mile is crowded with historic interest and scenic beauty.

Two highways lead from Louisville to the Lincoln Farm. One, 69 miles in length, goes through Cherokee Park and on to Bardstown and is filled to overflowing with attractions, including "Federal Hill," where Stephen Foster wrote "My Old Kentucky Home"; a schoolhouse where a king of

France earned his living for a year as a pedagogue; St. Joseph's cathedral, the oldest Catholic church west of the Alleghany mountains, which contains numerous masterpieces of old world paintings presented to it by this same king of France; Gethsemane Abbey and other famous Catholic institutions. It leads past a schoolhouse in which it is said Lincoln learned the alphabet and across Muldraugh's hill to Lincoln Farm, through a country every foot of which is rich in memories of the great emancipator.

Lincoln Way Scenic Road

The other road, the Lincoln way, is 57 miles in length and traverses a portion of Iroquois Park, crosses the historic Salt River of political significance on the new Lincoln bridge just completed at a cost



Monument and tomb of Zachary Taylor, 5 miles from Louisville

of over \$100,000, passes Fort hill, whose height is crowned with the Salt River fort of Civil War fame, climbs Muldraugh's hill upon a wonderful roadbed built by army engineers before the days of railroads, and after 20 miles of surpassing rural scenery reaches historic Elizabethtown, where Thomas Lincoln, the father of Abraham, made his monthly purchases, and where many Lincoln incidents are still treasured and recalled. Thence it rambles on to Hodgenville, the county seat of LaRue county, with the Weinman statue of Lincoln in the market place, and thence 3 miles to Lincoln Farm and the beautiful memorial hall, which contains the cabin in which Lincoln was born.

The property was settled and cleared by Thomas Lincoln in the early years of the nineteenth century and a rude cabin of one room was built on the hill above the spring. In this cabin Abraham Lincoln was born, February 12, 1809. The property passed through the hands of a number of owners, until an association was formed to purchase it and dedicate it to the nation as a memorial to Lincoln. A



Lincoln Memorial Hall which contains log cabin in which Abraham Lincoln was born

memorial building has been erected at a cost of \$160,000 and the original cabin is now housed in this building.

Two and one-half miles from Lincoln Memorial Hall is Buffalo. The route from this place to Mammoth Cave is 45.6 miles. The distance from Louisville to the cavern is 113 miles.

Kentucky's Stygian Caves

Thousands of tourists from this and foreign countries have visited Mammoth Cave, Wyandotte Cave and the Luray Caverns. The one locality in this country in which is to be found without doubt the greatest number of caverns is in Edmonson county, Kentucky. Underlying nearly the whole county are innumerable caves, some vast in extent, some small. It is said that there are not less than ninety caves within this limited territory that have been explored. Mammoth Cave is the largest of them all; Colossal Cavern the next largest in extent, but by far more magnificent and beautiful.

Occasionally fragments of half-burned reeds, a lost moccasin or a wooden bowl tell of visits of aborigines long before foot of civilized man had awakened the echoes of the lofty domes of Mammoth Cave. Change there has been, but it is so slow, so secret, that impressions formed three-quarters of a century ago are paralleled by those which are awakened today. There is only that change which comes from wider acquaintance with the windings of the chambers into those that are new, and formerly unknown, a change which makes the visitor despair of every fully unraveling all the relations of the passages and crevices along which he journeys or through which he crawls. The same massive rocks, scattered in the same profusion, meet the eye on every hand, for the cave has been pre-



Zachary Taylor's name carved on tree in Iroquois Park, Louisville

served in all its beauty as an original work of nature. The bridges over rivers and stairs leading up impassable

cliffs, the iron guards along places of danger, alone tell the visitor of the work of man.

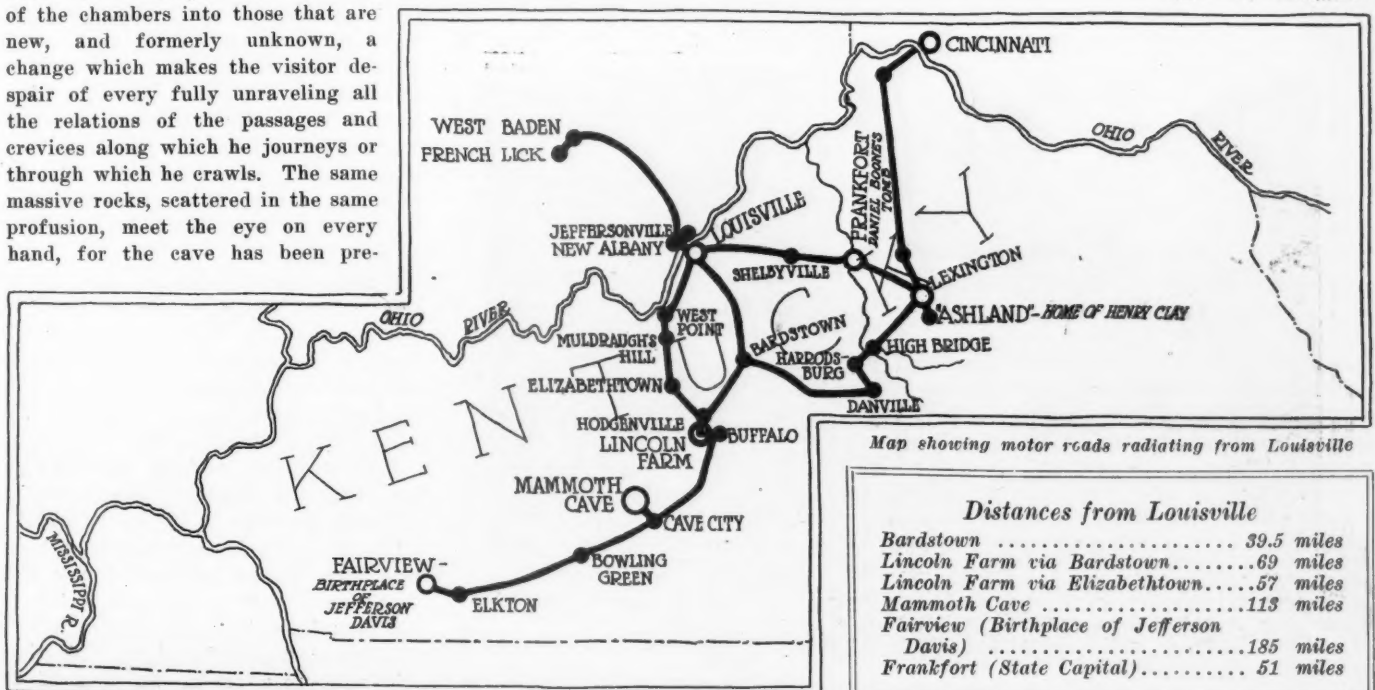
The Charm of Mammoth Cave

It is impossible to mention, less possible to describe, all the objects of interest to visitors in this most gigantic cavern of the world. In no respect have its attractions failed to meet the expectations of the intelligent visitor. To the unintelligent, its story is as little understood as would be the famous lyrics of Homer or the marble poems of Praxitiles. The shells and corals which dot the walls of Echo river or boss the smooth walls of Gorin's Dome tell a story to those alone who have some intimate acquaintance with Nature. The blind insects—beetles, crickets, mites, gnats—the eyeless fish and crustaceans and leeches, the snow-white toadstools, all are meaningless to those who have never questioned the physical cause of vision. The naturalist will find here a paradise—forms of life that are unique, that range from vertebrate to worm, and these all tell him a story of antiquity and of life-law that

only a naturalist may interpret. But if the tourist seeks the grand and impressive, if there be attraction in Stygian blackness, if the uncanny noises accompanying waters falling in recesses that have yet escaped search, if the unison of sound coming from the dark and unfathomed recesses of Echo river back to the ear with a harmony and beauty that no cathedral



View of the state capitol building at Frankfort



note ever yet equaled, find a response in any human heart, then Mammoth Cave will never cease to attract visitors of every degree and from every land.

The Echo river is one of the most remarkable features in this most remarkable group of wonders. Only a small portion of its whole course is accessible to visitors, but this part is truly wonderful. At times the river flows with almost imperceptible current, while at other times it fills quite to the top the great river hall, blotting out the Dead Sea and the River Styx, both of which are really parts of the underground stream. It is traversed by boats for a distance of about half a mile, and a ride over its clear waters is one of the unique experiences of the world. Nowhere else can it be duplicated.

Along the Kentucky River

While in Kentucky one should not fail to tour over the road that leads along the Kentucky river, which will reveal more beauties to the square mile than any journey through the Berkshires. The roads are splendidly kept. Thriving towns and growing cities offer excellent accommodations for motorists and are numerous in the central part of the state.

The new Q. and C. bridge over the Kentucky river, which is the highest railroad bridge in the world, is 21 miles from Lexington. It is of the cantilever type and constructed of steel throughout. The bridge is over 1,200 feet long, and the track level is 308 feet above low water mark. Visitors are allowed to walk the bridge and from its center an excellent view is obtained of Kentucky river at its junction with the Dix river.

From Lexington and Frankfort the roads leading to Louisville are in splendid condition and the trip can be made in a short time. Frankfort is the state capital and the traveler will find much to interest him there.



Boating on the Echo river in Kentucky's Mammoth Cave. Photograph copyrighted by Royal Photo Co.

Lexington via Frankfort 76.1 Miles. Heart of the Bluegrass Section

Fine roads radiate from the city in all directions, and beautiful country homes adorn every section. Some of the best known of these are "Ashland," the former home of Henry Clay, which is located 1 mile from the city on the Richmond pike; "Elmendorf," with its ten thousand acres, 7 miles north of the city on the old state pike; "Woodlawn," 15 miles north of the city, the home of "Maud S.," and "Poplar Hill," the home of "Nancy Hanks." Many others as attractive are found in all directions.



Motoring roads through Cherokee Park, Louisville

The capital was established in Frankfort in 1793, and seven buildings have been used by the lawmakers. The old capitol, built in 1828, is still standing, and in the stairway has an architectural feature of note. The new capitol is one of the most attractive buildings in the country. The Frankfort cemetery contains the tomb of Daniel Boone. The house is still standing in which Aaron Burr was tried for treason. The penitentiary, the state arsenal and the colored state normal school are located here. Frankfort is 51 miles from Louisville.

Louisville's Many Attractions

Not considering the many points of interest out in the state, a motor car trip through Louisville's three magnificent public parks and Jefferson county would more than repay the cost of the journey. Skirting Louisville on the east is Cherokee park, the most beautiful natural park on the western hemisphere. Its surface is undulating, and through it flows the middle fork of famous Beargrass creek. One who has enjoyed a trip over the 12 miles of macadamized roadways which twist and turn about through the grounds will assure the motorist that he will find no semblance of monotony.

Cherokee park covers an area of 400 acres. Here Nature is revealed in all her moods. Here are pavilions, beautiful lagoons, a skating pond, a golf course, the statue of Daniel Boone, the Hogan drinking fountain, swards and valleys, hundreds of squirrels that make their home in the big forest giants, and the Butterfly and Moth Museum which contains nearly ten thousand specimens in the known world.

Cherokee park is connected by a boulevard, some 18 miles long and 150 feet wide, with Iroquois park on the south and Shawnee park located on the western side of the city on the banks of the Ohio river.

Iroquois park covers an area of 670



Ashland, the home of Henry Clay

acres and, it is estimated, that 15,000 native trees stand within its borders. President Zachary Taylor often visited the park and carved his name on a tree which still stands there. A network of macadamized roads offers abundant opportunity for the motorist to view this veritable wonderland and obtain fine distant prospects of the beautiful country adjacent to the metropolis of Kentucky.

Louis Phillippe's Masterpieces

Louisville and vicinity possesses several valuable paintings, old world masterpieces brought to America on the verge of the French Revolution by Louis Phillippe before he became king of France, and whose old home and chapel are located $\frac{1}{2}$ mile from the city limits of Louisville.

The Audubon Museum in Central park contains over 10,000 specimens of birds and bird skins. The General Museum in the basement of the free public library contains rare curios of every description, ranging from a Mammoth Cave stalactite to the mummy of an Egyptian king.

Five miles from the city limits is located the old Zachary Taylor home and farm, containing a magnificent monument erected by the federal government to "Old Rough and Ready's" memory, and in front of the old home where Taylor lived before he became president of the United States, still stands a tremendous elm tree, under which Jefferson Davis courted Taylor's daughter, whom he subsequently married, to lose her as a young bride.

Corn Island, the headquarters of George Rogers Clark, and from which he set out to conquer and add to our country's domains the hostile territory now embracing the states of Ohio, Indiana, Illinois, Wisconsin and Michigan, is located at the foot of Tenth street, and the bones of the great soldier now rest in Cave Hill cemetery. Near Louisville still stands a portion of the Clark homestead, where lived George Rogers Clark, General William Clark, of

the Lewis and Clark expedition, and several other brothers, who were officers in the Revolutionary army.

Louisville was a storm center in the

Points of Interest at Frankfort

New capitol building.

Cemetery containing tomb of Daniel Boone.

House where Aaron Burr was tried for treason.

Penitentiary.

State arsenal.

great American civil war and hundreds of tragic and historic scenes were enacted within her borders. A monument to the Confederate soldiers, towering 200 feet high, is on Third street. The finest and

costliest monument of Thomas Jefferson in existence stands in front of the Jefferson county courthouse and is a recognition of the impress that Jefferson's private life, aside from his public duties, made upon the history of Kentucky. The historic statue of Henry Clay, by Joel T. Hart, is in the rotunda of the courthouse.

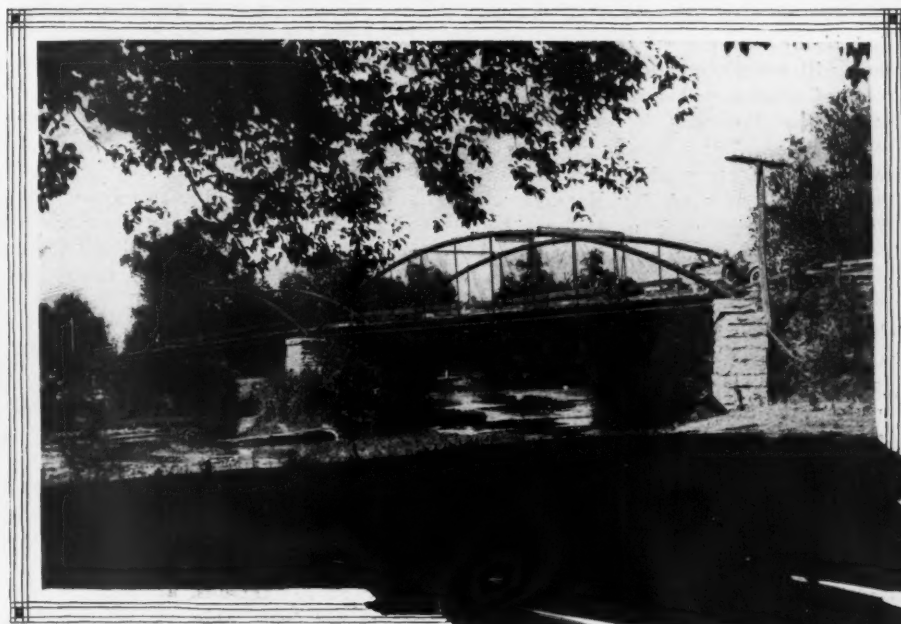
Directly on the road from Indianapolis to Louisville may be visited French Lick and West Baden Springs, two of the most famous inland resorts in America, and not greatly distant are the equally famous waters of Martinsville.

Kentucky Famed in Song

Kentucky has been exploited in poetry and fiction. Song writers have helped to make it famous. "My Old Kentucky Home" is sung wherever the English language is spoken. The works of a hundred authors, playwrights and poets have added to her fame; her sons have shed luster on her name in every line of endeavor, and surely no other state commands a greater loyalty from her children. If any section of America is entitled to be called famous, it is certainly the bluegrass state.

Hospitable residents of Kentucky are anxious to share their delights with the visiting tourist. They wish to make Kentucky a mecca for motorists, as popular as the Berkshires or the Adirondacks. They believe that their state ranks equally in historic and scenic charm with other regions of this country which are more widely advertised and more commonly admired by a greater number of vagabonds de luxe. The Louisville Automobile Club is a leader in this movement to attract tourists to Kentucky. It recently published a small route book that contains a wealth of touring data. In addition, the secretary of the club is ready to furnish road information that should make a tour of the state a joy-ride extraordinary.

Come to Kentucky.



Picturesque rustic bridge over stream near Frankfort, Ky.

Indianapolis Places 300-Inch Limit on 1915 Race

Chicago-Boston Tour Abandoned—Racing Gossip

By C. G. Sinsabaugh

CHICAGO, June 9—Formal announcement is made by the management of the Indianapolis speedway of plans for the 500-mile race of 1915. This announcement is of considerable interest to the motor industry because of the radical change made in the piston displacement limit for next year, while the sporting fraternity will be pleased to know that the management contemplates changes in the racing plant that will be conducive to the safety first principle advocated by Carl Fisher.

As was anticipated, Fisher has set 300 inches as the piston displacement limit for next year, and he promises that no change will be made from this for the next 3 years. Fisher believes that it has been most effectually demonstrated that the engineers can build small motors that are faster than the big ones of 2 and 3 years ago. He believes in encouraging the small motor, both from the viewpoint of speed and fuel economy.

Small Motors Show Speed

Bearing him out in his argument is the recent race in which the smaller motors distinguished themselves. Nearly all the foreign cars were motored under 400 inches and the Duray Peugeot, which finished second at the rate of 80.99 miles per hour, only was 183 inches. The Thomas Delage was 380.2, the Goux Peugeot 341.7, the Guyot Delage 380.2, the Grant Sunbeam 273 and the Chassagne Sunbeam 275. The Belgian Excelsior was 446.

The changes in the speedway are to consist in widening the track and building a retaining wall entirely around it. This widening of the track is to be on the inside and 15 feet will be put on there, so that if the cars run off the track proper they will not plunge into the dirt. The pole, of course, will remain where it is now so that the track proper may remain at 2½ miles. The retaining wall for the entire circumference of the track always has been a hobby of Ray Harroun who, claims that with such a wall accidents would be reduced to a minimum.

In addition to this Fisher intends to build a clubhouse for the drivers and mechanics, which will be provided with such modern features as a swimming pool, billiard tables, etc. He realizes that the drivers make the show and that their comfort should be looked after as much as possible.

Sioux City is pushing work on its Fourth of July meet, for which a purse of \$25,000 is offered. Sixteen entries have been made and it is anticipated that the full field of twenty-seven will be made up by the end of the week.

The Chicago-Boston day and night non-motor stop run for the Glidden, Anderson



SAXON CAR THAT IS NOW EN ROUTE ON LINCOLN HIGHWAY CHRISTENING TOUR

and National trophies, set for June 29-July 2, is off, the Chicago Automobile Club, promoter of the affair, having thrown up the sponge after making a vain hunt for entries. Despite the fact that the A. A. A. made provision for a stock car class, it was impossible to interest the makers in the proposition. The club needed at least thirty entries to finance the tour. It would have been possible to have secured about a dozen cars, but rather than have the tour fizzle the club decided to abandon it.

The entries closed June 1 and at that time there were only two nominations in hand—both from dealers. One was a Hupmobile entry made by Thomas J. Hay, which was in the Anderson cup division, while the other was a Jeffery which had been put in the owners' division by A. M. Robbins.

Good Field for Sioux City

Within the week Sioux City has received entries from Spencer Wishart with the Mercer and Joe Horan with the Metropol.

The track will be open for practice the latter part of this week. Already Rickenbacher is there with the two Duesenbergs and the Mason. Grant and his Sunbeams will arrive about June 15 and the Stutzes will be shipped about the same time. Callahan with the Stafford already is there, waiting for practice to start. Twenty-eight garages have been installed, along with electric lights and work benches. The grandstand, seating 12,000, is almost ready, and a tunnel is being built under the track.

There is every reason to believe that at least two of the foreign cars will be seen at Sioux City. Billy Knipper will be there with the Delage Thomas drove to victory at Indianapolis, although the entry has not been made as yet. Knipper has secured a backer in an enthusiast, James E. Wilson, a resident of Rochester,

who intends campaigning the Delage this year.

Bob Burman is after the Peugeot which Boillot had at Indianapolis. He has a new backer in L. C. Erbes of Minneapolis, who recently bought the Cutting plant. Erbes is trying to buy the Peugeot for Burman and if the deal is made he will race it around the circuit this summer.

The Maxwell team will appear at Tacoma on the Fourth. Ernie Moross has signed Hughie Hughes for his third driver and also has in his string the Rayfield Hughes built for the 500-mile race. Sammy Brock with the Ray also is with Moross.

Another bit of gossip is that Walter Flanders, pleased at the showing in the Indianapolis race, has commissioned Ray Harroun to build three Maxwells for the 1915 sweepstakes, complying of course with the 300-inch restriction.

Entry blanks for the Elgin road races are now ready for mailing. The dates are August 21-22, with the Chicago Automobile Club trophy race for 450-inch cars the first day and the Elgin National trophy, a free-for-all, on the second day. The course now is being put in readiness for the meet.

Indications are that Elgin will have the best entry list in its history. Burman, if he gets the Peugeot, is an early entrant, it is said; Knipper is expected there with his Delage; de Palma is coming back from Europe with an English Vauxhall; the Stutz is going in with two cars; the Mercer will defend its trophies; the Maxwell team is promised, while there are at least two dozen others on the list of possibilities.

SAXON CROSSING CONTINENT

New York, June 5—The Saxon car which recently covered 135 miles a day for 30 days in Detroit, started from New York yesterday on a transcontinental trip that marks the official christening of the Lin-

coln highway. When the journey is ended at San Francisco, this car will hold a record not only for being the first motor car run under official sanction over the Lincoln highway.

Officials of the Lincoln Highway Association have authorized the Saxon as the car to make the initial trip over this road, and are co-operating with the Saxon Motor Co. to accord big receptions to the car and its drivers along the way.

This Saxon, in crossing the continent, will travel 3,389 miles, and will pass through 540 towns and cities. Starting at New York, the Lincoln highway Saxon dipped its back wheels into the Atlantic ocean and proceeded to Philadelphia by way of Jersey City and Trenton. From there the road leads westward, among the important cities on the line of travel being Pittsburgh, Fort Wayne, South Bend, Cedar Rapids, Omaha, Denver, Salt Lake City, Reno, Carson City, Sacramento, Oakland, and then to San Francisco, where the front wheels of the car will be dipped in the Pacific ocean, and a bottle of water carried all the way from the Atlantic will be emptied. The schedule calls for an average speed of 20 miles an hour and an average distance each day of 125 miles.

BENZ TRIES FOR HOUR RECORD

London, May 27.—After traveling ten laps of the Brooklands track at a speed of 107.82 miles an hour Saturday, Hornsted was forced to abandon his attempt to shatter the 1-hour record of 107 miles 1672 yards, held by the Sunbeam, when the gasoline tank of the big Benz sprang a leak on the twelfth circuit of the speedway.

Hornsted's drive was not altogether fruitless, however. He covered the first 2.75 miles at a rate of 101.57 miles per hour, the fastest lap from a standing start ever done, and the Benz's succeeding laps were clocked at 109.94, 110.68, 111.42, 109.46, 105.47, 106.19, 106.19, 109.22, 108.51 and 107.34 miles per hour.

In addition, Hornsted secured the ten-lap record from a standing start in both the 90-horsepower R. A. C. rating class and the cubic capacity class J.

JOE DAWSON WILL RECOVER

Indianapolis, Ind., June 9—Joe Dawson, injured in the Memorial day race, is out of danger, says the doctors at the hospital. They state that the star driver is mending rapidly and that he will be discharged from the hospital in about 6 weeks, despite the fact that several vertebra are cracked.

CEIRANO WINS TARGA FLORIO

Paris, May 25—For the second time in the history of the Sicilian classic, Ceirano, driving a S. C. A. T., won the Targa Florio road race today. The victor hung up a new record for the 'round-Sicily event, covering the 620 miles in 16 hours 51 minutes 31 seconds, an average speed of 36.85 miles per hour.

Thirty-four cars, representing the class

of the European makes, were sent away yesterday morning for the first day's test. Three previous winners were on the mark—the redoubtable Nazzaro, who finished first in the Fiat in 1907 and duplicated that feat with a car of his own make last year; C. Snipe, an Englishman, who took the 1912 event with the S. C. A. T.; and Ceirano, who annexed the cup in 1911.

Ceirano completed the first day's drive with a lead of 13 minutes over Sivocechi, who put a de Vecchi into second place. When the race was resumed this morning, Ceirano was off like a madman and continually increased his advantage, finishing 1 hour 50 minutes ahead of his nearest competitor.

Trailing the triumphant Ceirano were a de Vecchi, driven by Gloria, a Fiat with Lopez at the wheel, a second S. C. A. T., a Nazzaro and an Elka in the order named. The 1914 race was a decisive victory for Italy as have been the seven previous ones.

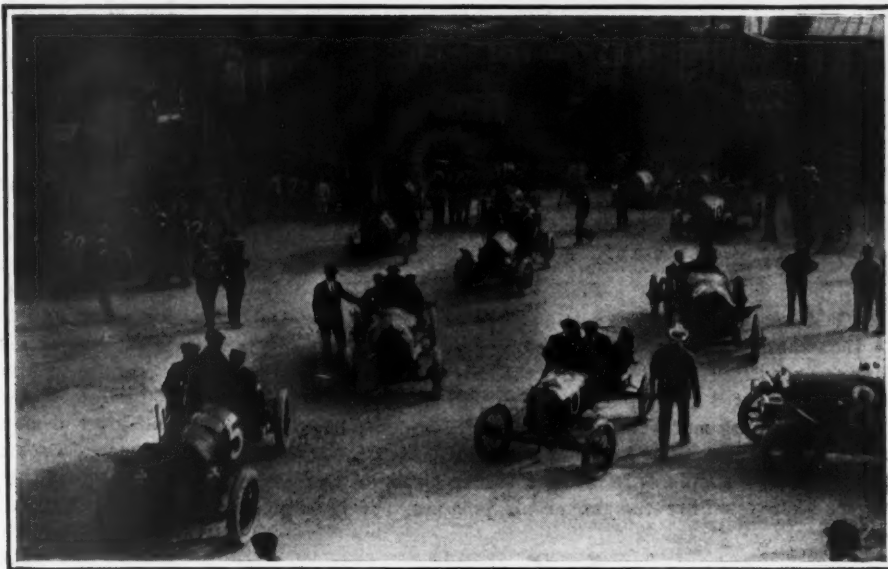
The secret of Ceirano's victory lay in the hill-climbing powers of his car. He

was invincible on the grades, of which the Madonie course is largely composed.

Nazzaro, Italy's speed idol, finished third on the first day, but today fell behind and retired before Ceirano finished.

AMERICANS IN ALPINE TOUR

London, May 23.—Six American cars, three Cadillacs and three Overlands, will compete in the Austrian Alpine trials to be held from June 14 to June 23 this year. This run is one of the most strenuous on the European motor calendar, as the long climb through the passes of the Alps taxes the skill of driver and stamina of car to the limit. Seventy-four cars in all have been entered in this year's trials and it is expected that this number will be increased before the lists close. The team entries of three cars each are as follows: Darracq, Minerva, Laurin-Clement, Puch, Austro-Daimler, Audi, Overland, Cadillac, N. A. G., Hansa and Austrian Fiat. The Cadillac cars were nominated by F. S. Bennett, the English agent of the Cadillac company.



START OF THE FIRST DAY OF THE TARGA FLORIO RACE



CEIRANO IN S. C. A. T., WINNER OF TARGA FLORIO



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Study Battery Care

WITH the opening of touring, it is imperative that the owner-driver gives his battery that share of attention which it merits. He must examine it every 10 days if it is used for starting and lighting purposes. It is most important that each cell be tested to see if there is enough liquid in it. In hot weather the electrolyte evaporates very quickly, and sometimes a cell will be half empty at the end of a week of hot weather if there is much touring done. Distilled water must be added. This water can be purchased in gallon bottles at any drug store at a nominal price. A gallon will suffice for several months.

THE modus operandi of testing your battery is a simple one. If you have been running your car several weeks or months and have not tried your battery you are courting trouble which the battery may not show for several months, but which will be sure to affect it sooner or later. If you have not been testing your battery because you do not know how to do it the sooner you learn how the better. Your car should be equipped with a testing hydrometer and syringe, together with directions on how to use it. Both the hydrometer and the syringe may look formidable, but they are not. It is nearly as simple to handle them as it is for the doctor to place a thermometer under your tongue and take the temperature of the body.

IF YOU are afraid to try testing your battery the first time, then the next best thing is to stop at your garage, or at the battery repair depot and observe the workman there while he spends 5 minutes doing the job. You will find it very simple. There is nothing mathematical about it. You don't have to be a chemist; in fact, there is nothing difficult from start to finish. It is nearly as simple as inflating a tire and using a tire gauge to see that you have the proper air pressure, but it is much easier work.

ADDING distilled water is in reality all you have to do providing you have started out with a new car and battery. The distilled water is added with a syringe. Each cell should be filled so as the plates are covered. A good way to do this is to fill the cell to the top, and then draw out a little from all of the cells after they are filled. It rarely is necessary to add anything but distilled water throughout the season. If your electrolyte shows too great a weakness then the battery man should be consulted. If it is impossible to get distilled water, rain water collected a few minutes after the shower has started will do equally well. The rain water collected at the start of a shower is generally filled with foreign particles from the roofs of buildings, etc., and should not be used. In case rain water is not available there are many distilled table waters that are entirely satisfactory for the work.

IF YOU are to have entire success with your battery during the present touring season, it is highly imperative that you give it attention. Keep it properly filled with distilled water. The battery is a silent factor in your car; if a cell goes nearly dry there is not any noise, the same as when a bearing goes dry, or any immediate difficulty, as when a tire goes flat, or you run out of gasoline, or the brakes won't hold. But the fact that there is not any immediate evidence of distress is not any reason

why you should neglect the matter. In fact this silence of the battery is a great reason why you should give it regular attention. It will not do to content yourself with the fact that you may not have to put in water for another week or two. By this policy you are not being fair to the battery. Get the battery habit the same as you get the habit of filling the gasoline tank, putting oil in the motor, inflating the tires, or getting the body washed. It is equally important.

Extravagance in Oiling

THE winning car at the Indianapolis 500-mile race consumed less than 2 gallons of castor oil during the race, and another car which finished near the tail-end of those that completed the 500 miles used 35 gallons of oil. The difference between 2 gallons of castor oil and 35 gallons of high-grade cylinder oil must not be taken as any indication of the relative lubricating merits of these two products, but these two figures show the differences in lubricating systems of some of the racing cars that competed in this speedway classic.

IF A car can average 82.47 miles per hour for 500 miles on 2 gallons of oil, then why waste 35 gallons in another car going the same distance and not averaging 70 miles per hour? It is inexcusable extravagance where such quantities of oil are used. Using 35 gallons of oil for 500 miles is equivalent to 1 gallon for every 14 miles. Aside from the expense factor in reality there is no excuse for such a condition of affairs. It is impossible to use such an amount of oil effectively in a motor traveling 500 miles. The condition of the speedway before the race was half over demonstrated that the oil was not being used but burned. In some cases great quantities of oil leaked from the crankcase of the motor or through the end bearings, and so was not made use of. There were other examples of where a fracture in the crankcase allowed the oil to drain out and become a menace to the safety of others on the track.

IT IS to be hoped that 1915 will not only see the Indianapolis speedway entirely eliminate the smoke nuisance due to the burning of oil, but that it will also be necessary for every racing car to be fitted with some compact style of metal underpan which will prevent oil leakage from getting on the tracks to the danger of other contestants. It would be desirable that these underpans be provided with felt lining which would absorb the oil, and make it impossible even in case of a rupture of the crankcase, to have the safety of the track interfered with.

THE consensus of opinion of many of the drivers is that it will be possible to have for 1915 speed averages of 85 miles per hour for the 500 miles provided the track is kept free of oil. In the recent race the oily condition of the turns greatly interfered with many of the contestants by way of cutting down speed and also making driving more dangerous. If we are to get that benefit from racing which we should, then the oil question must be taken under consideration. Rigid regulations must be laid down for next year's race and our manufacturers must build to meet these improved conditions the same as the foreign maker has had to do. It may be necessary to maintain a higher speed on the turns next year.

Early Summer Clothing Hints



Distinctive sport coat which is a new 1914 model. It is made of a basket weave material with a very large black and white check. It has two pleats, front and back, running over the shoulders and a wide belt running from the back pleats. It has a loose set-in sleeve and a Capuchin collar. The side slit pocket is concealed in the front pleat. This coat is from Mandel Bros., Chicago, and sells for \$35.



Mustard-colored sport coat of novelty mixture with button-through collar and cuffs of Copenhagen blue dwtyn. The distinctive feature of this coat is a drop yoke back finished with three ball buttons of self material and blind buttonholes. It has a swirl back with a swell bottom, and side slit pockets. This coat comes from Mandel Bros., Chicago, and sells for \$25.



Rubberized balmacaan motoring coat of black and white tweed mixture. It has a convertible collar and loose sleeves with deep cuffs and fastens with bone ball buttons. It has a satin yoke lining and satin-edged seams. This coat is from The Hub, Chicago, and sells for \$13.50.

Two balmacaan motoring coats for women. The one on the right is an olive green and brown English mixture with a Poirer collar of green broadcloth. The coat buttons close to the neck and has a cape shoulder with pleats, swirl back held in with belt, the tabs of which only show, large



cuffs and slit side pockets. It is lined to the waist with green satin. This coat is shown by Mandel Bros., and is marked \$30. The coat on the left is a skeleton-lined, rainproof balmacaan of black and white mixture. It also is from Mandel Bros. and sells for \$18.50.

Court Holds Newtone Does Not Infringe Klaxon

Important Horn Decision Handed Down in New York

NEW YORK, June 9—The Newtone horn, which was declared an infringer of the Klaxon patents by the United States district court in Brooklyn in January, was victorious on appeal today, when the United States circuit court of appeals for the second circuit, sitting in New York city, reversed the decision of the lower court, declaring the general claim of the Klaxon patents invalid and the remainder not infringed.

While there are many legal angles to the situation, the Automobile Supply Mfg. Co., of Brooklyn, the Newtone maker, is now released from all restraint on the part of the Lovell-McConnell Mfg. Co., Newark, N. J., the Klaxon maker, and may proceed with the manufacture of the Newtone line of motor-driven horns. Reissue of the Klaxon patents, appeal to the supreme court, suits on other patents and other matters may enter into the future situation, but the Newtone now is unrestrained.

While Judge Coxe, who wrote the opinion, declared that Newtone does not infringe those claims which he did not declare invalid, he did not pass upon the validity of the remaining and detailed claims of the Klaxon patents. These were declared valid by the lower court and were left untouched by the appellate court, so that their validity has yet to be passed upon by a court of appeals. What the court did say was that, valid or invalid, Newtone does not infringe.

Judge Coxe's opinion is much briefer than that of the lower court. In one paragraph he states that the evidence and arguments are detailed and involved and that the court did not grasp it at all. "After endeavoring to follow experts and counsel through the infinite mazes of the record," he wrote, "the predominant thought left upon the mind of the court is the difficulty of discovering the exact nature of the controversy in this wilderness of words."

Somewhat startling to those familiar with the use and purpose of motor car warning signals is Judge Coxe's statement that he can see no reason why anyone should wish to depart from the melodious old coach horn and bring out anything like the sharp, barking signal now in use and demand. He concludes that the ideal horn has yet to be invented, disregarding the fact that the diaphragm horn has been seized upon by the public and has worked efficiently. He favors something more musical.

In touching upon anticipation the Pierman patent is cited, but that this was an uncommercial affair is stated by George Cooper Dean and which makes plain the attitude of the Lovell-McConnell company as to the present and the future.

That it is but the beginning of the litigation is stated by Dean. In fact, a new

patent was taken out in April and upon this suits will likely be commenced immediately. The patent is claimed to cover the Newtone Superior horn. Neither does the decision have a direct effect upon suits by Klaxon in other judicial districts or circuits, actions in other sections having to be carried to consummation, although decisions in one court are cited in another and may have a bearing in that manner.

SHANKS JOINS PREMIER FORCES

New York, June 8—Charles B. Shanks has resigned as business manager of the Class Journal Co. of New York to become sales and advertising director of the Premier Motor Mfg. Co. of Indianapolis.

For nearly 10 years Mr. Shanks occupied the position of general sales and advertising manager for the Winton Motor Car Co. of Cleveland, after which he took up residence in California, where the climate was expected to restore vitality lost through strenuous effort applied to constructive selling operations during the pioneer years of the industry's development. The California mission was successful.

The new office of general director of sales and advertising will not alter the status of R. W. Macey, Jr., sales manager, or Walter Bieling, advertising manager.

Mr. Shanks will assume his new duties about June 15.

APPLE SERVICE NOT IMPAIRED

Dayton, O., June 8—Erroneous reports have been spread regarding the damage caused by a fire in the machine shop of the Apple Electric Co., of this city, recently. The plant was not ruined, as early reports had it, and the office, engineering, service, shipping and battery facilities were unimpaired. The finished stock was not reached by the blaze and General Manager F. A. Cornell states that it did not upset deliveries in the least. The company states that there has been no let-up in deliveries.

HUPMOBILE BREAKS A RECORD

Detroit, Mich., June 8—During April and May the Hupp Motor Car Co. smashed all production records, according to F. A. Harris, commercial manager of the company. Mr. Harris takes a very optimistic view on the spring business and states that the Hupmobile works will reach record shipments during June and July.

SURVEY MAKING PROGRESS

Chicago, June 8—Tests have been completed upon three different motor car parts by Purdue university for the American Efficiency Survey of Motor Car Units. Based on these tests contracts have been signed with the survey by three prominent

manufacturers of the parts tested. The significant fact that the completion of each test is marked by immediate arrangements for advertising the particular make shown to be the best by these tests, is a tribute to the standing of the technical committee, which is conducting the examination. The engineers comprising the technical committee at Purdue also are the experts selected by the Master Car Builders' Association of America, and the laboratories of the university proper and of the Master Car Builders' Association have had to be supplemented, it is stated, by special equipment for the survey tests.

The committee in charge of the tests comprises C. S. Benjamin, dean of the engineering school at Purdue university; Louis E. Endsley, M. E., professor of railway and mechanical engineering, and in charge of the Master Car Builders' Association tests; M. J. Golden, M. E., director of the mechanical engineering laboratories; Robert G. Pilkington, M. E., resident engineer, and C. Francis Harding, B. S. E. E., assisted by eight engineers in the employ of the survey.

STROMBERG SUES LONGUEMARE

New York, June 8—Charging the Longuemare Carbureter Co., New York city, with infringing the Ahara patent, No. 684662, and the Richard patent, No. 791501, the Stromberg Motor Devices Co., Chicago, filed suit this week in the United States district court in New York city. The action is directed against Ludwig Arnson and Alfred Michaelis, trading as the Longuemare Carbureter Co. at 246 West Fifty-ninth street. This suit follows litigation against the Zenith carbureter in Chicago and the proceedings in those cases are cited as grounds for the granting of a preliminary injunction in the Longuemare suit.

RECEIVER FOR RANDALL-FAICHNEY

Boston, June 8—The Randall-Faichney Co. has gone into the hands of the receivers. Internal dissension and lack of ready capital were the principal considerations in the appointment of receivers. The company, which makes Jericho and Jubilee horns and other accessories, offered no opposition to the move, and C. P. Blinn, vice-president of the National Union Bank, Boston, one of the large creditors, and Renton Whidden, Brookline, were named as receivers.

It is proposed to carry on the business under the receivership, which is expected to be of short duration. While unsecured claims total \$282,000, of which \$25,000 is merchandise, the company's inventory totals \$287,000, and it is operating in a factory on Atherton street worth \$175,000 and which it practically owns.

Chamber of Commerce Re-Elects Clifton Its President

Annual Meeting of National Body Held in New York

NEW YORK, June 4—At the annual meeting of the National Automobile Chamber of Commerce, held today, Colonel Charles Clifton, of the Pierce-Arrow company, was re-elected president by the representatives of seventy-four companies present, which was the largest to attend a meeting in the history of this organization or its predecessors, the Automobile Board of Trade, and the Association of Licensed Automobile Manufacturers. By his re-election today Colonel Clifton enters upon another cycle of a long period of service with the governing bodies in the motor industry. For practically 8 years he has been president of either the A. L. A. M., the Automobile Board of Trade or the latest governing body, namely, the National Automobile Chamber of Commerce.

The other officials elected are as follows: Vice-president, Wilfred C. Leland, Cadillac; second vice-president, Hugh Chalmers, Chalmers, gasoline division; second vice-president, Windsor T. White, White, commercial vehicle division; second vice-president, H. H. Rice, Waverley, electric vehicle division; secretary, R. D. Chapin, Hudson; treasurer, George Pope, Pope-Hartford; general manager, Alfred Reeves.

The board of directors consists of the officers and the following: S. T. Davis, Jr., Locomobile; C. C. Hanch, Marmon; Alvan Macauley, Packard; W. E. Metzger, Argo; H. O. Smith, Premier; Albert L. Pope, Pope-Hartford; L. H. Kittredge, Peerless; John N. Willys, Overland, and E. R. Benson, Studebaker.

Much of the time at the annual meeting was taken up with the receiving of reports by the different committees. The commercial vehicle committee in its report recommended a convention to be held during the coming fall of motor truck manufacturers, the date and other details connected therewith to be determined upon by the committee.

Work of Traffic Division

During the year the work of the traffic committee has been a most important factor, and this committee which has handled the question of railroad freight cars for the shipment of motor cars throughout the country has checked over 101,000 freight shipping bills of different motor car manufacturers and has accomplished reductions and corrections on these representing a saving of \$60,000 to the manufacturers and dealers. This committee always is represented at conferences before the interstate commerce commission where questions relative to increase in freight rates on motor cars and accessories are taken up. The committee now has on hand the question of spotting, by which is meant railroads charging for switching cars to loading platforms, etc. Another question is that

of dunnage, by this being the charge timber needed in freight cars when anchoring motor cars for shipment.

The show committee reported the dates for both Chicago and New York for next season, which dates will be announced later.

Throughout the entire year the legislative committee has been exerting its influence in getting more just laws on the statute books of the different states for the regulation of passenger and commercial vehicles.

Although the work of the good roads committee is not spectacular it has been effective, in that it has been the means of effectively moulding public opinion during the past year by the wide distribution of literature and the desirability of laying good roads at greater cost rather than cheaper roads at much less cost. The sentiment now is becoming general that it is cheaper in the long run to build a good road that will endure rather than a cheap road that is short-lived.

The report of the patents committee was anticipated with greater interest than any of the others, due to the recent organization of the Kardo company, which controls nine patents on rear axle construction, and which company is controlled by three organizations, namely, Packard, Peerless and the American Ball Bearing Co. When the report of the committee was presented at the general meeting it was the consensus of opinion that it was not good ethics on

the part of these companies to organize a separate patent-holding organization when the National Automobile Chamber of Commerce has a special patent department and had a patent committee on which both the Packard and Peerless companies were represented, but which representatives resigned some time ago.

Both sides argued the relative matters of the case, the members of the association in general feeling that it was not desirable to have the industry plunged into a heavy patent litigation on rear axle patents, two of which in the Kardo group are considered as important patents. The patent committee, consisting of C. C. Hanch, chairman, and Windsor T. White, Wilfred C. Leland, L. E. Latta and W. H. Van Dervoort, reported that the committee is conducting an exhaustive examination into all the patents controlled by the Kardo company.

APRIL EXPORT FIGURES

Washington, D. C., June 9—Three thousand two hundred ninety-one pleasure cars and commercial vehicles were shipped abroad during April, according to the latest figures compiled by federal bureau of statistics. The value was \$2,833,154. For the corresponding month of last year the number was 2,766, and the value \$2,904,224. For 10 months period ending with April the exports were, 23,762 cars valued at \$21,598,810 in 1914 and 20,096 cars valued at \$20,666,593 in 1913.

England Ready for Its Big Road Race

American Hudson in Isle of Man Event

LONDON, May 27.—Two weeks from today, June 10, the Isle of Man will be the scene of the international motor car race for the Tourist trophy, a 2-day event for stock cars to be held under the auspices of the Royal Automobile Club of Great Britain. Approximately 600 miles, or sixteen laps of the course, will be covered by the contestants in the 2 days of racing. Twenty-four cars have been entered and will be sent away in the following order:

No.	Car	Driver
1	Minerva	Porporato
2	Humber	Burgess
3	Straker-Squire	Unnamed
4	Sunbeam	K. Guinness
5	Star	Lisle
6	Vauxhall	Hancock
7	Adler	Unnamed
8	D. F. P.	Bentley
9	S. A. V. A.	Berger
10	Rawlinson-Hudson	Rawlinson
11	Crosley	Blanchi
12	Minerva	Molon
13	Humber	Tuck
14	Straker-Squire	Clement
15	Sunbeam	A. Guinness
16	Star	Cathie
17	Vauxhall	Watson
18	Adler	Unnamed
19	Minerva	Riecken

20	Humber	Wright
21	Sunbeam	Resta
22	Vauxhall	Higginson
23	Adler	Unnamed
24	Martini	Unnamed

The Tourist trophy race is open to standard or stock cars equipped with four-cylinder motors with a piston displacement of 202.6 cubic inches and a minimum weight of 2,800 pounds, including driver and mechanic. The rules further stipulate a minimum wheelbase of 9 feet, minimum tread of 54 inches, minimum body width of 40 inches and gasoline tank of 50 gallons capacity, sufficient for both days' racing. The rules permit the use of any kind of fuel and there is a prize of \$500 for the car making the best showing on a fuel other than gasoline. Five thousand dollars will be awarded the winner and \$1250 to the second car to finish. In addition, there is a team prize of \$1500.

The course measures 37.5 miles and has few long straightaways and several severe grades. The start and finishing line is at Douglas.

Metropolitan Engineers Outline Their Ideal Car

Interesting Round-Table Discussion Takes Place

NEW YORK, June 6—At a meeting of the metropolitan section of the S. A. E. held at the Automobile Club of America last night a round-table discussion took place on the ideal car. This subject which is to be discussed at the summer meeting of the parent body at Cape May will prove a fruitful source of debate if the meeting of the section is a sample of what is to come. The members present were all invited to give their ideals and then a detailed discussion was taken up in which the car was gone over part by part.

William M. Power was first called upon to give some of the specifications of what would be his ideal were his means unlimited and if he were untrammelled by the requirements of the salesroom. He specified a six-cylinder motor of small bore and long stroke with the weight kept to the lowest possible limit and said that he would not put either electric lighting or starting on the car. He also wanted right drive.

McComb Gives His Views

Henry G. McComb, gasoline division, General Vehicle Co., specified a 3 by 5-inch six-cylinder car in which the flywheel was made of heavy weight. His clutch specifications agreed somewhat with Mr. Powers' except that in addition to asking for the single-plate dry-disk type he thought that cork inserts should be used. As for the springing, this should be given particular attention and it was his belief that the three-quarter elliptic rear would prove the best design. One of the specifications he mentioned was wire wheels, but as far as the starting system was concerned he thought that that should be installed because one of the requirements of an ideal car is comfort, and removing the starter would put more work on the driver.

Arthur Buzby wants a four-cylinder motor in his ideal car with plenty of gear-shifting. He believes that it is fallacious to design a car that will be capable of going as high as 50 miles an hour on high gear and at the same time capable of being throttled to 4 or 5 miles an hour without shifting. The engine in his belief should be operated at a higher mean effective pressure than is now common practice.

P. P. Dean, Ingersoll Rand Co., in specifying his ideal car, said it would be a light touring model with a four-cylinder engine. He favored the overhead-valve because of the greater hill-climbing ability of the car for a given piston displacement. He stated that a motor with a rating of about 30 horsepower on the S. A. E. formula would be about the right size for a fairly heavy car, or, for example, a 3.75 by 4-inch on a 2,000-pound car. As for a clutch, he said he would fit anything but a cone design. As a measurement of the ability of the car he mentioned an example

of the hill that the car should be able to climb on high gear, the Abby, a well-known demonstration hill in this city having a mean slope of 8 per cent. He thought that the car should be able to take this hill at 20 miles per hour.

There were several members present who were more or less agreed on the high-speed small-bore, long-stroke motor with a power curve that did not start to fall off until around 3,000 revolutions per minute. This motor should be used in connection with a four-speed gearbox, although many differed as to whether the fourth speed should be above direct or not. The rear axle desired was either a worm drive or as a compromise between the worm and the bevel gear, the spiral bevel. Cantilever rear springs were regarded as a desirable feature for this car and wire wheels, if the car could be kept clean readily. The pressed steel wheel found supporters.

As to body design, many differences of opinion were found among the members. Several had similar views on the body situation, their ideas incorporating a streamline type of roadster with a rear deck into which folded a seat with a carrying capacity of two passengers. This seat is invisible when not in use and the cover does not interrupt the streamline deck. The compartment into which the seats fold forms a baggage-carrying space with considerable capacity. Only one incorporated in his ideal any but a poppet-valve motor and this was one who liked the rotary valve.

The most interesting part of the argument hinged around the question as to whether the four or six would be better for all-around use. Those who had driven sixes stated that until that time they had never known what it was to feel as if the car had no motor. The smooth acceleration and the absence of vibration was strongly argued. On the other hand, there were others who had had experience with both types and who stated that it was their belief if anyone were put blindfolded into the tonneau of a car they could not tell whether they were riding in a four or a six.

Discussing the Clutch

The clutch proved to be another mooted point and while the cone clutch was at first criticised by many, its supporters rallied and proved to be more numerous than its opponents. Louis P. Prossen, of the Mason-Seamon Transportation Co., which handles hundreds of taxicabs in this city, stood valiantly for the cone clutch. He stated that it required little attention, was smooth and had long life. Two members present, one who had driven his car for 8 years and another for 11, each stated that with the cone clutch they had not been bothered with any clutch trouble. After the

cone clutch in popularity would be dry plate, according to those who took part in the debate.

There were many devotees of the cantilever rear spring present and others who favored the three-quarter elliptic. In specifying their springs the members believed that although the spring maker was under difficulties, on the ideal car the springs should be designed to meet the weight of the passengers. At the present time as stock models are turned out, the springs are designed to meet the maximum weight requirements and, as a result, they are too heavy for the normal load, giving a stiff-riding car.

COLE'S 1915 CARS OUTLINED

Indianapolis, Ind., June 8—The Cole Motor Car Co. announces that the full 1915 Cole line will consist of a four-cylinder, a little six and a big six model. Each model uses the three-point suspended Northway unit power plant; the Timken front and rear axles and bearings; Mayo radiator; Spicer universal joints; Gemmer steering gear; hydraulic pressed steel frames; Detroit Steel Product springs; Rich tungsten steel valves; Stromberg carbureter; Delco electric lighting, starting and ignition system; Janney-Steinmetz gasoline tank; Firestone tires and demountable rims and the Cole-Stewart-Warner gravity gasoline control. The four-cylinder Cole job has a 118-inch wheelbase and will retail for \$1665; the little six of 120-inch wheelbase price will be \$1865; while the big six selling at \$2465 will have 136-inch wheelbase. The body design on the new models are streamline effect, with deep comfortable upholstery. The latest style pantasote top and ventilating windshield is included in the equipment. The color scheme is a rich dark Brewster green.

PIERCE-ARROW SERIES THREE READY

Buffalo, N. Y., June 8—The Pierce-Arrow Motor Car Co., in announcing its series three line, states that there will be no change in prices and that as before there will be three models—the 66-horsepower car, known as 66 A-3; the 48-horsepower, known as 48 B-3, and the 38-horsepower, the 38 C-3. In general appearance the new cars differ radically from their predecessors. Without reducing the road clearance, it has been found possible to lower the bodies and running boards by increasing the drop of the central portion of the frame. This change has made it necessary to abandon gravity fuel feed and adopt pressure feed. This permits the company to raise the carbureter and increase its accessibility.

The pedal for operating the electric self-starter has given way to a single-push button on the dash. Another feature in the

way of equipment is the fitting of Goodrich Silvertown cord tires. The fenders are of new and wider design and the combination of lamp and fenders is retained. The standard touring cars are fitted with individual front seats, arranged with a space between to give easy passage from the front to the rear compartment. All cars are right-hand drive and right-hand control.

The bodies are of an entirely new design. The standard brougham, laundaulet, suburban and landau bodies have rounded corners, domed roof and the optional flat-roofed broughams and suburbans have roofs with slightly rounded corners, dipping toward the front of the car. The brougham, laundaulet and suburban landau are arranged with unusually wide side windows and are built only with flat roofs.

PULLMAN NEW MODELS ANNOUNCED

York, Pa., June 8—Models of the Pullman car for the coming season are continued last season's models with a few minor changes. The new line is called the 6-48, which is practically a continuation of the 6-48-A of the present season. A year's experience with the car has convinced the Pullman Motor Car Co. that it needs little or no changes and shipments of the car under the new designation and with the slight improvements have begun, the car being marketed as the 1915 model. Its price remains the same, \$2,350, with two or five-passenger bodies, and a seven-passenger body at \$100 additional. The Vulcan electric gearshift is offered as an option at an added cost of \$200.

Alterations in the car mostly look toward greater comfort. Thus, the wheelbase has been lengthened 4 inches, making it 134 inches, the body has been enlarged so that the driver has 2 inches more room and the tonneau gives the passengers 6 inches additional space. The seats have been raised and the upholstering widened and deepened. Entrance to the tonneau is made easier by placing the rear doors somewhat farther back. The one-man top is retained, but it is covered now by leatherette instead of mohair, and the dashboard is leather covered.

Mechanically, the development has been toward greater reliability, various parts have been lightened where experience has shown that it was possible to cut away the metal. The spring suspension has been strengthened and a new radiator employed which combined greater cooling capacity and less weight than that of the previous one. The electric system is of the 12-volt design.

POPE MATTERS IN COURT

Hartford, Conn., June 5.—A petition for the approval of the semi-annual report was presented by Colonel George Pope, receiver of the Pope Mfg. Co., to Judge William L. Bennett in the superior court today. The receiver asked permission to continue the business of the company in

this state for another 3 months after June 22. The receiver says he confidently expects before the expiration of that time, unless the stockholders or creditors have been able to present some favorable plan for reorganization involving the purchase of the plants as a whole, he will be obliged to recommend cessation of manufacturing operations and forced liquidation.

Referring the court to schedules on file the receiver says it will be evident that there will be but one question as to the future conduct of the business on which there can be any difference of opinion. All the product now in the course of manufacture must be completed and sold, excepting possibly 150 model 35 cars, which are not yet in finished parts.

KNOX REORGANIZATION COMPLETE

Springfield, Mass., June 10—Special telegram—By a decision just handed down by Judge Morton in the United States court the last question in the transfer of the old Knox company to the new Knox Motors Co. of Springfield has been settled. Judge Morton has confirmed the sale of the entire plant and property to E. O. Sutton, who now is treasurer of the new company.

Pending confirmation of the sale, tentative plans for the conduct and wide extension of the Knox business had been formed and were partly under way, but with the receipt of news that the sale had been confirmed the execution of these plans was begun with a rush.

H. G. Fisk, treasurer of the Fisk Rubber Co., already had been elected president of the Knox Motors Co. The Knox company has had the nucleus of a dealers' organization through branches in New York, Boston, Chicago and Kansas City, and these will be continued and their organization enlarged and their scope increased widely.

The production department already had partially completed systematizing the factory and the effect of Judge Morton's decision is to make possible the unification of the entire Knox organization in a way not so practicable heretofore.

An immediate result of the confirmation was the issuing of production orders for a number of Knox Martin tractors and a quantity of fire apparatus of the latest designs. The latest Knox model touring cars were coming through the factory at the time and an added impetus was given them.

Detroit Announces May Production

Twenty-Four Concerns Make 41,092 Cars

DETROIT, MICH., June 4—During the month of May twenty-four motor car manufacturers of Detroit made a total of 41,092 cars, according to the figures furnished by the makers. This total refers to the gasoline cars only, as no information was obtained from the electric vehicle manufacturers.

Big as this 1 month's output may seem to be, it does not represent, however, the full capacity of the various plants, for the simple reason that the month of May is one of the duller of the year and several factories are operating with a reduced working force.

Prospects for a larger production in June were expressed, which seems to indicate that the industry is in the very best condition. The general manager of one of the factories told the story in these few words: "Never were we so certain about the future and never did we go ahead with less fear that there might be an overproduction."

The Mexican situation and the unrest in business circles throughout the country does not seem to affect the Detroit motor car builders. Speaking about the matter, the head of one of the leading concerns said: "There will be as many motor cars sold as the dealers will have to sell. It's up to the manufacturers to supply them, and we have not heard from a single dealer handling our car that we should not ship what he ordered. It seems to me that the people who intend to buy cars are going to buy them no matter what the country's condi-

tions are. Of course, it would be different if we were at war with Mexico, but there is no fear about that. I think from what I have observed—and I recently have been all through the west—that the estimates of the number of cars the dealers will sell this year will be greatly above the published estimates. The demand is so great that the factories hardly can keep up, even by having day and night shifts. The business is especially good in Illinois, Kansas and California."

One Detroit concern, the Ford Motor Co., has made 24,285 cars in May, or 59.1 per cent of the total made by the twenty-four Detroit manufacturers. The second largest concern's production totals about 4,500 cars and the third largest about 3,000. Seven manufacturers built more than 1,000 cars each.

In general, 95 to 98 per cent of the cars made were disposed of to the dealers in the United States and Canada. "We cannot take up foreign business," said an official of a large concern, "because our agents here in the country want more cars than we can make. It is very good to do foreign business, but first you must look after your own people. As long as the demand is so great in the states let us take care of the states first."

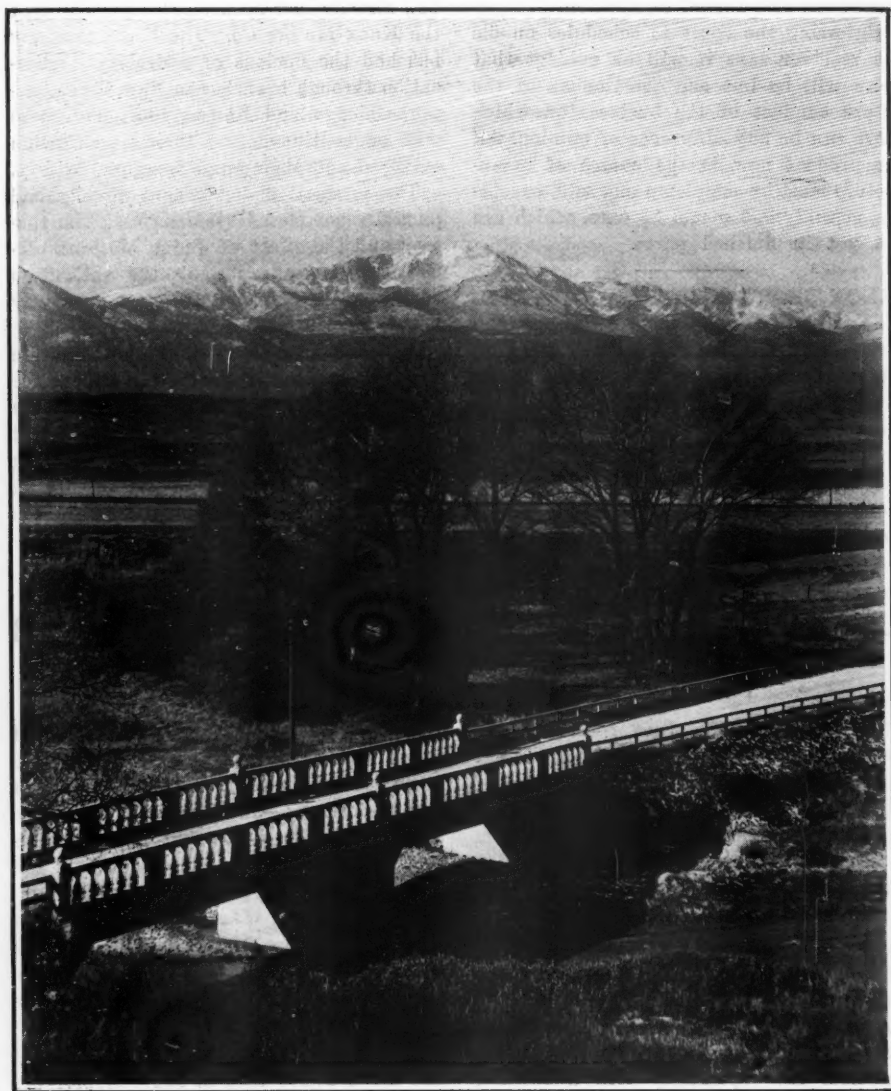
"As far as we are concerned, we will go after the foreign trade after we are prepared to take care of it. It would not be a good business policy to try and sell cars abroad and not be able to supply them or have to deprive some of our dealers here."



Routes and Touring Information



The Recent Colorado to the Gulf Tour and What It Developed



PIKE'S PEAK FROM THE COLORADO TO THE GULF HIGHWAY

Extending from the mountains of Colorado to the Gulf of Mexico the Colorado to the Gulf highway is one of the great north and south roads of the trans-Mississippi region. Within the last 2 years a great deal of development work has placed this road in excellent condition for practically the entire distance. This view shows something of the kind of roads and bridges the Texas motorist will find in Colorado

THE recent Colorado to the gulf sociability run was one of the longest tours of this character ever carried out by commercial organizations in the interest of good roads. The members of the party returned May 27 to their home cities, Colorado Springs, Pueblo and Manitou, after a 2500-mile tour through Texas, Oklahoma and Kansas extending over a period of 3 weeks.

The tour was planned and carried out to encourage the greater development of the main highways of the southwest, connecting these states; to bring the people of Colorado into closer acquaintance with the people of Kansas, Oklahoma and Texas and

with conditions in these states, and to demonstrate not only the feasibility but the pleasures of touring over the roads which are being rapidly developed in this section of the United States.

On the eleventh day after the party had left the Garden of the Gods, at the foot of Pike's Peak, it reached Galveston and dipped the travel-stained cars in the Gulf of Mexico. It was the first organized party to have made the run from the mountains of Colorado to the shores of the gulf, and if negotiated the distance of 1250 miles with an average day's run of 115 miles, including time spent in visiting the towns en route.

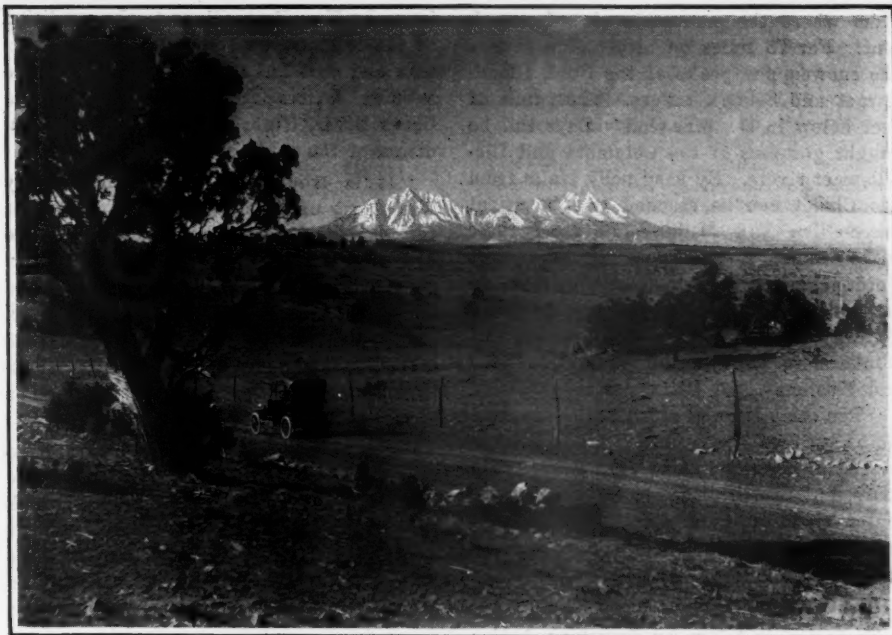
Road conditions, on the whole, were found to be good, and, considering the fact that the party followed, during the entire trip, the heaviest rains which the southwest has experienced in years, the roads were surprisingly good. Some poor roads were encountered, but the encouraging feature is that in most cases where poor roads now exist work has either already been started or bonds have been voted for improvement. Throughout Texas, Oklahoma and Kansas there is a growing sentiment in favor of good roads, and this sentiment is finding expression in the building of splendid highways.

Thirty-two in Party

Leaving their homes in Pueblo, Manitou and Colorado Springs on Wednesday, May 6, the Colorado party of thirty-two men in nine cars followed the Colorado to the gulf highway through Walsenburg and Trinidad and across Raton pass to Raton, N. M., and eastward via Des Moines and Clayton, N. M. Because of recent snows and rains on the pass, some difficulty was encountered this first day, but under normal conditions the roads through New Mexico would be in good condition.

At Texline, the party entered the state of Texas, and during the 16 days following it never was out of the state. Because the Canadian river had washed away the bridge, the Amarillo Chamber of Commerce arranged for shipment of the cars from Dalhart to Amarillo, and the next morning the party was ready to resume its trip. Through the Panhandle country it found splendid roads and constant evidences of recent activity and road development. Everywhere there was keen interest in the Colorado to the gulf highway and a determination to make this a completely graded and developed highway. The party visited Claude, Goodnight, Clarendon, Hadley, Memphis, Estelline, Childress, Quanah, Chillicothe, Vernon, Electra, Henrietta, Bellevue, Bowie, Decatur, Fort Worth and Dallas. At this point a change was made from the original itinerary, and it was decided to go directly to the gulf by way of Waxahachie, Hillsboro, West, Waco, Marlin, Bremond, Calvert, Hearne, Bryan, Navasota, Hempstead and Houston to Galveston.

During this part of the trip weather conditions were most favorable, but on the first day of the homeward journey, with the cars headed from Houston to San Antonio, heavy rains were encountered, and although the Coloradans battled for 3 days against the almost unprecedented flood conditions, they finally were forced to ship the cars home from Louis, Texas. Floods, not poor roads, was the cause of



SPANISH PEAKS AS SEEN FROM JUST SOUTH OF WALSENBURG, COLO.

this change; in fact, had the party reached Wharton even a few hours prior to its actual arrival time, it is highly probable that it would have been able to have gone through to Victoria and San Antonio with little difficulty.

At Austin Governor O. B. Colquitt officially received the visitors, and expressed to E. J. Eaton, official representative of Governor E. L. Ammons, of Colorado, his interest in the mission of the party, Texas' keen activity in good road development and its desire to cooperate with Colorado in every way possible.

The return trip through Oklahoma and Kansas followed closely the original itinerary, passing through Sherman, Dennison, Texas; Durant, Oklahoma, Ardmore, Wynnewood, Pauls Valley, Purcell, Norman, Oklahoma City, Guthrie, Perry, Ponca City, Newkirk; Arkansas City, Kan.; Winfield, Wichita, Newton, Hutchinson, Sterling, Great Bend, Larned, Kinsley, Dodge City, Garden City and Syracuse, Kan.; thence through Colorado to the home cities of the tourists.

Great Interest Shown

Great interest was everywhere expressed in the mission of the trip—that of promoting the main highways connecting Texas, Oklahoma and Kansas with Colorado and New Mexico. Throughout Texas good roads sentiment is manifesting itself in a practical way in the voting of bond issues and in the construction of real weather-proof roads. This is the first organized party to blaze the way from the mountains of Colorado to the shores of the Gulf of Mexico, and although the trip was in some places strenuous, members of the party were unanimous in declaring that before many months there will be a practicable road open every mile of the way. For many miles, in places, stretches of perfect road were found, and these stretches

are rapidly being connected into a continuous highway.

In Oklahoma, the recent organization of the Oklahoma, Texas and Gulf highway has given an impetus to road development, and in practically every county special

efforts had been made to bring the road to the best possible condition in anticipation of this tour. For this reason, the Coloradoans regretted exceedingly that they were unable to make the trip on their own wheels, but they were shown pieces of road at various points which were an indication of the activity in progress.

Situation in Kansas

Kansas, too, is alive to good roads, and has them. The Santa Fe trail, over which the return was mapped out, is a well-graded and improved highway, and while the travelers did not have opportunity to ride over any portions, they caught glimpses of it from the train windows, both in Kansas and Colorado, and received reports sufficient to indicate that it is already a splendid highway, with much improvement already provided for this coming year.

After the party was compelled to take to the train, it was given several opportunities to travel over sections of the highways, and in this way was enabled to judge of road conditions in many sections. The Denison Chamber of Commerce and the motor club escorted the Coloradoans from Sherman to Denison over a splendid road. The Wynnewood people extended a like invitation to traverse the road through Pauls Valley to the town of the same name.

Canada Promises Real Motor Road

Coast-to-Coast Route Described

CANADA'S motor highway is best described by Consul-General R. E. Mansfield, of Vancouver, B. C., who tells Uncle Sam of the progress of the work through the Daily Consular and Trade Reports. Mr. Mansfield says:

"There is perhaps no better example of the remarkable progress being made by Canada in providing transportation facilities throughout the length and breadth of the Dominion than the construction of a motor highway from ocean to ocean, which



TYPICAL STRETCH OF ROAD IN TEXAS

is nearing completion at the present time.

"Twenty-five years ago the plan to build a railroad from Halifax to Vancouver was considered visionary and impracticable. To cross the barren wastes above Lake Superior, the vast prairies of Saskatchewan, and the mountain passes of Alberta and British Columbia then was considered by some of the best engineers to be physically impossible. Yet today one great continental railway is under successful operation, another is nearing completion, and a third is under construction.

"A few years ago no one would have thought of motoring through Canada from ocean to ocean as among the possibilities of the near future, but today motor cars are running almost the entire length of the new Canadian transcontinental highway, and only a few more links of the chain are needed to permit the motorist to make the trip in safety and comfort. From Halifax to Sudbury, from Winnipeg to the Great Divide, the trail is nearly finished, and the more difficult roads through the mountains of British Columbia are rapidly nearing completion.

"When completed this will furnish one of the longest and one of the most beautiful and picturesque motor routes in the world. From the land of Acadia to the shores of the Pacific it will run 3,000 miles through the fertile plains and valleys and over mountain ranges.

Scenery Is Picturesque

"The most picturesque part of the trip is from Calgary to Vancouver. From Calgary the route leaves the prairies, mounts the foothills of the Rockies, and penetrates into their fastnesses 90 miles away at Banff, from where the road turns into the Vermilion pass and then down the valley of the Columbia to Cranbrook. Already the run from Cranbrook to Creston has been made by motor car, and it will not be long until the trail to Nelson, Grand Forks, and Vancouver is finished.

"When this great route is completed it will not be necessary for Canadian motorists to incur the expense of foreign travel, for no finer trip can be made under the flag of any land than that over this transcontinental highway. Even the Tyrolean or Swiss Alps can not surpass the Selkirks or the Rocky mountains for grandeur, beauty, and variety of scenery. In a few hours the motorist can travel Switzerland from border to border, but it will take many days to see all the splendors of the great northwest.

"An interesting feature of this route will be the number and variety of attractive side trips it offers. Many new roads connecting with the main highway and suitable for motor driving are finished already and others are under construction, which open up new regions of beauty. One of these will be the road up Mount Revelstoke, 4 miles of which is already finished; 9 miles more of a 7 per cent graded macadam roadway will extend it to the summit, 6,150 feet above sea level,

from where the panoramic view is excellent. For 75 miles on either side extend the snowcapped peaks of the Gold, Illecillewaet and Selkirk ranges. Thousands of feet below in the pine-clad valleys can be caught glimpses of the Columbia and Illecillewaet rivers. By easy pony trails from the Chalet can be reached two beautiful lakes—Eva and Millar—and from their rocky shores a panorama of the Great Gordon glacier is unfolded. Other scenic attractions along which the great motor highway will pass are the Columbia and Windermere valleys, the Vermillion pass and Kootenay and Okanogan lakes.

"The completion of this transcontinental motor trail will be of interest not only to American motorists as an attractive scenic route, but it will also give impetus to the motor trade in Canada, opening up new markets for American-made cars, and increase trade opportunities in that line."

THE MIDLAND TRAIL

Exception is taken by Secretary Antles of the Midland Trail Association to the statement made in Motor Age, May 7

issue, by Tom Botterill, as to the condition of the Midland trail between Grand Junction and Salt Lake City. Mr. Antles also submits letters from Price, Elgin, and Green River, Utah, which tells of the condition of the route at the present time.

"It is true after considerable money was spent on this highway in 1913 that the road was partially damaged in Price canyon, Utah," writes the secretary. "This, however, was repaired within 4 days. This was a new road built hurriedly in order to accommodate the 1913 travel, and, like any new road in the mountainous country, it necessarily gives us more trouble for the first year.

"The letters which we are inclosing no doubt will best convey the spirit of the people in the communities through which the Midland trail passes, and this spirit will need no emphasis on our part to assure Motor Age that this road will be kept in good condition for motor tourists and that storm damage will be as promptly repaired over this road as over any other transcontinental highway."

Road Conditions on the Pacific Coast

FOLLOWING are reports from the California State Automobile Association and the Automobile Club of Southern California on the Pacific coast highways:

San Francisco North on Coast Road

To Sausalito conditions are rough but on through Petaluma, Santa Rosa, Healdsburg, Cloverdale, Ukiah, Hopland, Mendocino, Ft. Bragg, Westport, Briceland, Ferndale, Eureka, Freshwater, Arcata, Trinidad, Crescent City and Grants Pass all roads are in good condition.

Stockton North

Stockton to Sacramento, Roseville and Marysville is a macadam road except 15 miles of good dirt; Marysville to Chico via Gridley and Live Oak is fair, likewise via Oroville and Durham fair; Chico to Tehama, fair except between Vina and Tehama; Tehama to Red Bluff good; Red Bluff to Redding, good; Redding to Dunsmuir via Kennet, good; Dunsmuir to Portland passable. To Klamath Falls it is rough but passable.

Sacramento West

To Lake Tahoe via Folsom, Green Valley and Placerville it is good to the 45-mile post, then 5 miles of snow 5 feet deep. To Auburn via old Auburn good road; to Nevada City and Colfax good, but rough to Downieville. Reno to Fallon and Ely via Lincoln highway good.

San Francisco South Via Valley Route

From San Francisco to Oakland, San Leandro, Haywards and thence west to Stockton, over a good macadam highway, south from Stockton to Ripon and to a point two miles north of Atwater the state highway is complete and the detour into Atwater is in fair condition. From Atwater to a point within two miles of Merced is macadam, but this last two miles is rough.

From Merced to Athlone the road is in fair shape, but from Athlone to Chowchilla rather chunky. From Chowchilla it is necessary to detour easterly to Fairmead, and from Fairmead to Madera the road is complete to Fresno. From Fresno to Malaga the macadam has been completed, but owing

to the rough condition of the road from Malaga south it is best to travel by way of Sanger, Bradley, Dinuba and Munson to Visalia, Visalia to Famosa. There is a good oiled road part of the way and for the rest good dirt.

Famosa to Bakersfield is quite rough, especially the last 10 miles into Bakersfield. From Bakersfield toward Los Angeles, by way of the Tehachapi pass there are one or two rough stretches before reaching the foot of White Wolfe grade, but on over the summit of the Tehachapi pass to Mojave the road is in splendid condition.

Leaving Mojave there is about 1 mile of rough road, then a good road into Willow Springs. The first 3 miles from Willow Springs to Del Sur is rough, but the balance is O. K. From Del Sur southeasterly, toward Palmdale, there is one stretch of light sand, but the rest of the road is in good condition. From Palmdale the way leads down Mint canyon to Saugus and from that point over a splendid macadam boulevard to Los Angeles.

Coast Route South From San Francisco

San Francisco to San Jose via Niles, Haywards, San Leandro and Oakland is of course, excellent. San Jose to Gilroy and Hollister good. There is a fair road to the San Juan grade which is loose, rough, badly washed and dangerous. From the foot of the San Juan grade to Salinas there is a good dirt road and a short stretch of macadam north of Salinas.

The roads from Salinas are good almost without an exception to the foot of the Jolon grade which is slightly rough but easily passable. The best road from Bradley is via the Indian Hill road to San Miguel, the 20 miles to Paso Robles is in good condition but there is a short distance of stony, rough road hard on tires to Templeton. From San Luis Obispo, proceed to El Pizmo beach, Nipomo, cross the Santa Maria river and by Lompoc road or Foxen canyon to Santa Maria and Los Olivos. Los Olivos through Santa Ynez by way of San Marcos pass is an option to the Rincon sea-level highway to Ventura as the Casitas pass has not been repaired since the winter storms.

Ventura into Los Angeles is Camarillo, Somis, Moorpark, Simi, Chatsworth park and San Fernando.

Los Angeles South

To San Diego the road runs through La Habra, and for about 8 miles to Fullerton the road is extremely rough and disagreeable to drive over, but can be made without difficulty. Through Anaheim and Santa Ana the state road is complete, but on to Capistrano the roads are low, rolling bumps. To within about 15 miles of Oceanside the road is generally in fair condition, though with one or two of the hill grades somewhat loose and rough. A detour of 8 miles is

necessary bringing the tourist to within 6 miles of Oceanside, then a macadam highway extends into San Diego.

Inland Route to San Diego

Through Pomona, Ontario, Riverside to Elsinore there is only about 8 miles of unpaved road between Los Angeles and Riverside, but to route via Corona and Temescal canyon to Elsinore the pavement is practically left at Ontario and the rest of the distance over fair gravel. Elsinore south to Temecula the road is quite rough, a detour being advisable at Murrieta. Into San Diego by way of the Red Mountain grade, Fallbrook, Escondido and the Poway grade the roads are excellent.

Rocks; Rock Springs to Evanston is 114 miles through Blairtown, Green River, Lyman, Ft. Bridger, Dog Springs, Spring Valley; Evanston to Salt Lake City is 82 miles through Wasatch, Castle Rock, Coalville, Hoytsville, Wanship, Gorgoza, and Dale.

The latest information on road conditions was in the issue of May 7 in the touring department.

About 75 percent of the Lincoln highway is marked. West of the Nebraska line the marking is intermittent, but where the Lincoln highway marker does not appear, the old Transcontinental highway marking is said to be found.

New London, Ia.—Meadville, Pa.

New London, Ia.—Editor Motor Age.—Kindly give me a good route to Meadville, Pa. by way of Chicago.—W. B. Skelton, M. D.

From Burlington to Chicago is 236 miles running through Oquawka, Monmouth, Galesburg, Wataga, Oneida, Galva, Kewanee, Neponset, Wyanet, Princeton, Hollowayville, Seatonville, Peru, LaSalle, Ottawa, Somonauk, Sandwich, Plano, Montgomery, Aurora, Naperville, Hinsdale, Fullersburg, Proviso, and Forest park.

Chicago to South Bend is Kensington, Thornton, Highlands, Schererville, Valparaiso, LaPorte and New Carlisle; South Bend to Cleveland is 283 miles through Mishawaka, Osceola, Goshen, Lingonier, Wawaka, Kendallville, Edgerton, Bryan, Archbold, Napoleon, Pemberville, Woodville, Fremont, Clyde, Bellevue, Monroeville, Norwalk, Oberlin, and Elyria; the balance is Chagrin Falls, Auburn Center, Parkman, Southington, Warren, Churchill, Hubbard, Sharon, Mercer, Greenvale, Adamsville, Hartsville, Conneaut Lake and Meadville.

Chicago-Starved Rock Route

Ottawa, Ill.—Editor Motor Age.—In order that the motorists living in Chicago and vicinity, who desire to visit Starved Rock, Deer Park and the canyons of the Illinois, may be rid of the annoyance and difficulties of attempting to follow an unknown road, the Business Men's Association of Ottawa, Ill., has after thorough investigation, selected and marked the best road under all conditions of weather between Chicago and the Starved Rock State park 4 miles west of Ottawa to the park at Starved Rock, which is one of the greatest touring centers because of the location there of the state park. Motorists who have been to Starved Rock are most enthusiastic in their praises of its great scenic beauty.

It has been named the Starved Rock trail, and the marking begins at the west end of Washington boulevard, Chicago, then follows south one block to Madison street, west on Madison street across the Des Plaines river to Ninth avenue, Maywood, north on Ninth avenue to St. Charles avenue, west on St. Charles avenue and the Butterfield road to Naperville, thence through Aurora, Plano, Sandwich, Somonauk, Wedron and Sulphur Lick Springs and Ottawa to the park at Starved Rock.

The marking consists of a white band 30 inches in height painted on at least one pole on each side of the highway intersections in the country districts and about one pole in each block in the cities and towns. At the top and bottom of the white band is a yellow stripe 3 inches wide. The words "The Starved Rock Trail," are stenciled perpendicularly on the face of each pole. The yellow band can be plainly seen at a great distance and readily distinguishes the Starved Rock trail from other marked automobile routes which, in some instances, have used the same roads. Further information will be gladly furnished by the writer upon request.—Ottawa Business Mens' Association, by Horun Hull, Chairman Starved Rock Trail Committee.

Answers to Inquiries for Route Data

Tyler, Tex.—Detroit, Mich.

TYLER, TEX.—Editor Motor Age—What is the best route from Tyler to Detroit, Mich., stating about what kinds of roads would be traveled and the best season to make the trip?—A. D. Irion.

After reaching Granger the run to Fort Worth takes in Temple, Pendleton, McGregor, Waco, Valley Mills, Clifton, Meridian, Walnut Springs, Glen Rose, Rainbow, Nemo and Cleburne. Going 33 miles through Arlington and Grand Prairie to Dallas you turn north again and follow the Oklahoma, Texas and Gulf highway to Florence, Kan., approximately 515 miles. Dallas to Denison, Tex., is through McKinney, Melissa, Anna, Van Alstyne, Howe and Sherman, and after crossing the river to Durant the routing is Milburn, Mill Creek, Sulphur, Davis, Wynnewood, Lexington, Noble, Norman, Moore, Oklahoma City, Guthrie, Mulhall, Orlando, Perry, Ponca City, Newkirk, Arkansas City, Winfield, Douglas, Augusta, Eldorado and Burns.

Going into Kansas City over the Santa Fe trail is through Clements, Elmdale, Cottonwood Falls, Emporia, Waverly, Williamsburg, Ottawa, Edgerton, Olathe, Martin City and Westmoreland. Follow the route outlined for the inquirer from Independence, Kan., for the balance of the run.

You should procure Blue Books 5 and 4 for running directions of this entire trip. Each can be had for \$2.50 from the Automobile Blue Book Publishing Co., Karpen Bldg., Chicago.

You should have no difficulty in making the trip, and touring conditions are very good right now. You will find a variety of roads, dirt, gravel, sand stretches, etc., but nothing that should give you serious trouble.

Independence, Kan.—Niagara Falls, N. Y.

Independence, Kan.—Editor Motor Age—I expect to make a trip to Niagara Falls starting about the 1st of August. I would like the best route to Detroit, then go through Canada to the falls and returning home the best route by way of Cincinnati, Louisville, St. Louis and Kansas City. I am not particular as to the shortest route, but want the best in the way of scenery.—J. Bertenshaw.

The Inter-State trail with markings of blue and white on telegraph poles is 260 miles to Des Moines, and passes through Smithville, Edgerton, Dearborn, Halleck, St. Joseph, Rochester, Union Star, King City, Ford City, Albany, New Hampton, Bethany, Eagleville, Lamoni, Davis City, Leon, Osceola, Medora, Somerset. To Clinton the routing is through Colfax, Newton, Kellogg, Grinnell, Carnforth, Victor, Ladorna, Marengo, Amena, Cedar Rapids, Marion, Mt. Vernon, Mechanicsville, Clarence, Lowden and DeWitt.

The Lincoln highway to South Bend is then taken through Morrison, Sterling, Dixon, Rochelle, DeKalb, Geneva, Aurora, Joliet, Dyer, Valparaiso and Laporte. With 200 miles to Detroit the towns are Niles, Summerville, Dowagiac,

Paw Paw, Kalamazoo, Battle Creek, Marshall, Albion, Jackson, Chelsea, Ann Arbor, Ypsilanti, Wayne and Dearborn.

A 7-day permit can be secured without charge by stopping at the United States custom house to secure the necessary papers, and by complying with the regulations which they require.

After crossing the border to Windsor the run to London is 140 miles over good gravel roads through Ruthven, Leamington, Wheatley, Cedar Springs, Blenheim, Ridgetown, Highgate, Wardsville, Melbourne, Delaware and Lambeth. London to Niagara is 131 miles, being through Thamesford, Ingersoll, Woodstock, Oxford, Brantford, Hamilton, Grimsby, Vineland, Jordan, Homer, St. Davids and Stamford.

Returning west along the lake to Cleveland the routing is through Buffalo, Lackawanna, Hamburg, Brant, Irving, Portland, Westfield, Ripley, North East, Wesleyville, Erie, Conneaut, Amboy, Ashtabula, Geneva, Unionville, Painesville, Willoughby and Cleveland.

To Columbus, 161 miles, your route lies over macadam or gravel via Dover, Elyria, Oberlin, Wakeman, Norwalk, Monroeville, Bellevue, Bloomville, Brokensward, Bucyrus, Marion, Delaware, Lewis Center, Worthington; then 111 miles to Cincinnati, also over the same kind of roads, through West Jefferson, London, Cedarville, Xenia, Waynesville, Lebanon, Hageman, Mason, Sharon and Avondale.

A picturesque 136-mile run to Louisville is that running through Mack, Cleves, Homestead, Lawrenceburg, Aurora, Oberdeen, Enterprise, Vevay, crossing the river at Carrollton, then via New Castle, Eminence, Shelbyville, Simpsonville, St. Mathews.

Louisville to St. Louis is via Vincennes through Pekin, Salem, Paoli, Orleans, Mitchell, Shoals, Loogootee, Canaburg, Washington, Wheatland, Vincennes, Lawrenceville, Olney, Noble, Flora, Salem, Shattuck, Carlyle, Breeze, Lebanon, Belleville and Edgemont.

Across Missouri to Mexico, 124 miles, the routing is St. Charles, Colterville, Dardenne, Wentzville, Foristell, Wright City, Warrenton, Jonesburg, High Hill, New Florence, Montgomery, Wellsville, Martinsburg, Mexico; to Marshall, 97 miles, pass through Clark, Renick, Higbee, Yates, Armstrong, Glasgow, Slater; and to Kansas City, 92 miles, drive through Mt. Leonard, Blackburn, Higginsville, Mayview, Odessa, Oak Grove, Grain Valley, Independence and Centropolis.

Denver, Colo.—Salt Lake City, Utah

Lexington, Neb.—Please give me the best route from Denver to Salt Lake City. Is the Lincoln highway marked all the way through to California?—S. J. Hill.

Denver to Laramie is 130 miles through Lafayette, Longmont, Berthoud, Loveland, Fort Collins, La Porte, Ingleside, Dale Creek and Red Buttes. Laramie to Rawlins is 126 miles through Lookout, Pine Ridge, Medicine Bow, Hanna; Rawlins to Rock Spring, 114 miles through Wamsutter, Tipton, Point of

Steinmetz Predicts Electric Vehicle Will Supplant Gasoline

Electrical Engineer Startles N. E. L. A. and Power Men

PHILADELPHIA, Pa., June 8.—No more startling statement by a recognized authority ever has been issued to the motor car world than that made by Dr. C. P. Steinmetz at the recent convention of the National Electric Light Association, held in Philadelphia on June 1 to 5. The doctor stated flatly that, in his opinion, the electric vehicle was the eventual type, and that except for a few special installations the gasoline vehicle would not find a permanent field.

He opened up a vista to the central station men that was before undreamed of in connection with the sale of current for electric vehicle battery charging. Dr. Steinmetz advocated no less than complete maintenance of electric trucks and passenger vehicles by the central stations. He conjured them to seize the opportunity presented and to develop the latent possibilities in the electric before they were forestalled by the garages.

\$150,000,000 a Year

To show what these latent possibilities were, he estimated that, conservatively, electric trucks and passenger cars to a total number of 2,000,000 would be employed in the near future, whose total consumption of current per day would amount to 3,000,000,000 kilowatt-hours, or a source of revenue amounting to \$150,000,000 per year.

The occasion was the first technical session of the National Electric Light Association convention, held in the ballroom of the Bellevue-Stratford hotel, Philadelphia, Pa., June 2. The doctor was preceded by W. P. Kennedy, of the Electric Vehicle Association, who gave an introductory address on "The Greater Electric Vehicle Problems." In his paper Mr. Kennedy spoke as follows:

The potential possibilities of this power consumer as an integrating factor in the building up of off-peak-period load, while admitted by all, have been aggressively developed by comparatively few and, in fact, are just beginning to attract administrative attention, as worthy of consideration and on a par with the larger elemental influences likely to contribute to future big business extension. In view of the predominant progressiveness of this industry in comparison with others, it is remarkable that so important a projection should remain latent for such a lengthy introductory period, or should be relegated to the minor executive stratum in central station organizations. Particularly so, when other inferior devices have been seized upon and "boosted" as auxiliary means of stimulating the commercial load factor.

There can be no denial of the fact that in the past most of the central station companies have assumed little beyond a passive attitude in extending their organization facilities, in the belief that these were simply means to the ends of the manufacturers. Fortunately this has been changed. The distorted perspective is corrected. We now have a true sense of relations and recognize the fact that the manufacturer's product is, in reality, a means to the central station ends. However, it has required persistent and compelling exertion to justify this final conviction, that vehicle load development should be undertaken as the much more substantial and permanent accomplishment of implanting upon the commercial circuits of the supply companies a permanent utility for power consumption is perpetuity.

Equally conspicuous in the situation is the survival to date of the handful of courageous manufacturers conducting the strenuous cam-

EDITOR'S NOTE—Doctor C. P. Steinmetz, consulting engineer for the General Electric Co., is recognized as one of America's foremost authorities on electrical subjects and particularly on the generation and distribution of electrical power. Recently he has turned his attention to the electric vehicle from the central station man's point of view. In the electric vehicle he finds a most promising market for current and one which can be used to keep the central station load constant. Dr. Steinmetz is an engineer of sufficient authority that his predictions must be taken as having considerable weight

paign enforced upon them, not only in the conversion and education of their present allies, but in defeating the superior competition of the more popular and extensively exploited gasoline vehicle. Some few have succumbed to the severity of the struggle, but in numbers so small as to attest the rugged, determined character constituting the business fiber back of their project. There is no parallel in any kindred undertaking. Their accomplishments have been monumental and, above all, the tests of the past fifteen years, which have proved that the electric vehicle can be relied upon as one of the staple commodities among the electric utilities now necessary to our modern system of life.

As a business proposition commanding the attention of the captains of industry conditions could not be more attractive; the grist is on the threshold and the mill has ample power. Evidence of what has been done and can be done is abundant, convincing and conclusive. The indications put forward by the Electric Vehicle Association of America, in its parcel post project and the solution more recently suggested for the relief of freight terminal congestion, are but straws upon the surface of a torrent almost infinitely deep with opportunity.

Dr. Steinmetz addressed the session on what he called "The Relation of the Automobile to the Central Station Industry." First of all, he divided the development of all commercial appliances into three stages: the initial period of development, the culminative period in which sport serves to develop the technical features, and the period of decay as a sport and readjustment as a permanent business appliance.

Compares With Bicycle

In illustrating this point, he traced the development of the bicycle through its period of initial development when adventurers experimented with high-wheeled machines, meeting difficulties both mechanical and external, overcoming legal obstructions and contending with poor roads; the culminative period, in which the safety bicycle was taken up by the wealthy classes, made a sport of, and finally reduced in price so that cycling became a universal pastime with all classes. Then the period of decay as a sport, when the exclusive element abandoned long-distance riding, and, finally, cycling altogether, because of the elimination of the bicycle as a luxury, followed by the gradual falling off of popularity in the middle classes, and finally by the working classes. From thence he traced the development of the bicycle as a commercial vehicle and as a utility rather than as a luxury, calling attention to the fact that, while the bicycle has disappeared altogether as a sporting vehicle, more wheels were being sold than ever before.

Analogizing the development of the motor car with this, he traced the early experimental stage of the power vehicle down to its reduction to commercial perfection; its wonderful growth as a sporting vehicle, the waxing of cross-country touring, and finally the present-day development of the low-priced vehicle, which already has eliminated the exclusiveness of the motor car as a vehicle for the moneyed classes.

Although the doctor did not predict it, it was left to his hearers to surmise that the rich would next turn to flying as a pastime. He stated, however, that as surely as touring had become less popular, so would it continue.

He stated that heretofore the gasoline vehicle has had the advantage of the electric vehicle because of its greater speed and mileage capacity. This, he asserted, is fast becoming less of an advantage, as the elimination of the sporting use of the motor car will eliminate the demand for either speed or great mileage capacity, but that as the motor car becomes more of a staple, and distance riding decreases, the demand for a vehicle that can exceed the city speed limits and that can go farther than the average user ever has occasion to travel in a day also will decrease.

He called attention to the fact that, while the steam vehicle was lacking in neither speed capabilities nor in mileage capacity, it had gone out of general use because of its complication and the knowledge necessary to operate it properly. He recalled the same condition in respect to the bicycle. He stated that when the bicycle became no longer a fashionable sporting vehicle, the labor incident to its mechanical up-keep became more irksome, so that without the false stimulus of sport users found that it was work to care for it and work to operate it. Accordingly it was discarded except as a strictly utility appliance.

Electricity to Supplant Gasoline

That this also would happen in connection with the gasoline vehicle was his conclusion, and that when the motor car passes from the field of sport it would be found a burden on account of the work and attention incident to its up-keep—heretofore enjoyed as part of the fascination of the sport.

At this juncture, he stated that the electric vehicle would be turned to, owing to the fact that it was simpler to operate and required less mechanical attention, due to its simplicity.

In support of this he called attention to the fact that the actual requirements as to mileage are very low, much lower than most users imagine.

As to speed, it obviously is impossible to operate any vehicle at greater speed

within the boundaries of a city than is permitted by traffic and state laws. He thus showed the advantage of superior potentiality on the part of the gasoline vehicle to be passing, while the superior simplicity and ease of operation of the electric remains.

Next he brought out the fact that as the field for the motor car becomes changed from that of sport to pure utility, its design will also have to change. He stated that its maximum mileage capacity should be about 30 per day, and its highest speed 20 miles per hour. This, he stated, would require, for economy, a light battery, and to support such a battery, a light structure—something less than 1,000 pounds, in his opinion.

He stated that the construction would be less luxurious, as dealing with a dif-

ferent class of buyers, but would be made more along the lines of the low-priced gasoline vehicle of today. One of the most surprising predictions was that its price would be not to exceed \$500. He stated that there was a market for 1,000,000 such vehicles in the passenger field, and as many more in the truck field.

The next subject was as to the meaning of all this to the central station. To illustrate this, he stated that the total current consumption would be 1,500,000,000 kilowatt-hours per year more than at present, on 1,000,000 cars, or 3,000,000,000 kilowatt-hours per year total. This, he stated, would mean an income for the central stations of \$75,000,000 per year for each class of vehicle at 5 cents per kilowatt-hour, or \$150,000,000 per year total. The time set for this development was about 10 years.

progress can be assured in greater degree by some use or other of the money paid by the motor car owners.

In the so-called New Jersey test case, which the legislative board has taken to the United States supreme court, both points at issue are covered: one in reference to double taxation and the other charging a discrimination against one class of vehicle in preventing it from engaging in interstate commerce, which has been construed as meaning interstate travel for "business or pleasure."

In the opinion of the A. A. A. legislative board and its experienced legal adviser, Mr. Terry, the United States court decision would quickly straighten out the conflicting decisions of the several state courts, which are influenced greatly by reasons existing within the commonwealth itself.

The Present Legislative Situation

Status of Registration Law Explained

By C. C. Janes, Chairman of A. A. A. Legislative Board

IN summarizing the present legislative situation throughout the country, the chairman of the A. A. A. legislative board would call attention to the rather remarkable conflict in the several states in relation to motor taxation and the amazingly complicated list of state court decisions.

For instance, the Mississippi supreme court decided that the commonwealth could not, in addition to the personal property tax, require owners to pay a registration tax in excess of an amount necessary to meet the clerical cost of the issuance of the number. Even the proposition that the money thus raised would be expended on the highways did not justify, in the opinion of the court, the imposition of a substantial registration tax.

In California, its highest court ruled that the motor car could be taxed as personal property, and the owner also compelled to pay a registration tax, with the money thus raised used in the maintenance of the roads.

Idaho Gets Road Money

In Idaho, its supreme court ruled that a registration tax could be substituted for the personal property tax, and the money expended in roads construction and maintenance. This decision meant a great deal to a new state like Idaho, for it supplied, with other state money, a sufficient fund with which to start work on a state road system.

In Michigan, there came a protest from its most populous county—in which is located the city of Detroit—against the application of a law that made the registration tax in lieu of the personal property tax, and calling for the spending of the money on roads. While technically the supreme court based its decision on a defect in the title of the measure, it is far from a certainty that the same kind of a

Editor's Note—Several decisions have been rendered recently which lead motorists to believe that the time is not far distant when the registration laws of the country will be made uniform, when such a law is not a revenue-producer but designed simply to cover the cost of registration. C. C. Janes, chairman of the legislative board of the American Automobile Association, at the request of Motor Age, has undertaken to explain to motorists the exact status of the situation at the present time.

law with a perfectly drawn title would be upheld by the state's highest court.

Ohio Has Flat Fee

In Ohio, the common pleas court made a decision, which was substantially confirmed by the superior court, to the effect that a registration tax could not be imposed in addition to the personal property tax. This caused the state legislature to enact another measure calling for a moderate flat fee for all cars, and without reference to horsepower or weight.

For several years New York state has had a law which substituted the registration tax in lieu of any personal tax, and called for the expenditure of the money in the maintenance of the intercounty roads, which are built and maintained entirely at the expense of the commonwealth. A measure was introduced returning motor cars to the personal property list for taxation and doing away with the registration tax. This bill was defeated overwhelmingly in the senate, for it would at once have taken away from the state highway department over a million dollars for maintenance purposes, and the revenues of the state did not permit of the appropriation of a similar amount from the general fund.

While it is undoubtedly true that ultimately the public highways will become a general charge and be met by money from the general fund, the fact remains that for the present, in many states, their roads'

KENTUCKY LAW IN FORCE

Louisville, Ky., June 8—The new motor law passed by the 1914 Kentucky legislature becomes effective next Friday. The law forbids the driving of any vehicle at a speed greater than is "reasonable and proper." The following are limits placed as "reasonable and proper," any greater being prima facie evidence of unreasonable and improper speed. In closely built-up sections of incorporated cities 10 miles an hour; in residence districts 15 miles an hour; highways outside of the business and residence sections 20 miles an hour. On a curve, corner or crossing, where the operator's view is obstructed, 8 miles an hour is the limit.

A driver must come to a full stop in passing a frightened horse or near a street car taking on or discharging passengers. Any city may, however, pass traffic laws that place the speed limits lower than the statute.

The framers of the law were generous in providing fines and equally unselfish in finding acts which can be punished. Some of the law infractions and their penalties are:

- Fine of \$10 for fictitious chauffeur's badge.
- Fine of \$15 for employer of unlicensed chauffeur.
- Fine of \$10 for unlicensed chauffeur.
- Fine of \$15 to \$50 for intoxicated operator of motor vehicle.
- Fines of \$10 to \$100 for use of fictitious licenses.
- Fine of \$15 to \$100 for person under 16 who drives car without parent or guardian.
- Cancellation of vehicle license for owner who fails to report discharge of chauffeur because of drunkenness.
- Two to 5 years in the penitentiary for taking machine without owner's consent.
- Forfeiture of chauffeur's license on conviction of drunkenness.
- Fine of \$10 to \$50 for violation of any section not specifically enumerated. This may be augmented by 5 to 30 days in jail.

The new license prices follow: For vehicles of 25 horsepower or less, \$6; between 25 and 50, \$11, and above 50 horsepower, \$20. A motorcycle registration fee is \$5.

CARTER PRICE MISSTATED

The price of the Ford special Carter carbureter outfit is \$17 instead of \$20.40, as stated on page 44, Motor Age, issue of May 28.



The Readers' Clearing House



THE CARE OF A STORAGE BATTERY

How to Test for Gravity of Electrolyte—
Hints on Operation

CLAY CENTER, Neb.—Editor Motor Age—Kindly explain in detail how to fill the storage battery on my 1913 Cadillac; it only tests 1.000.

2—Is there any danger in breaking a battery jar when putting in the mixture?

3—Should the acid be put in and the battery then charged from an outside direct current source?—R. B. Graham.

1—The care of a storage battery chiefly lies in seeing that the electrolyte always covers the plate. A certain amount of water evaporates during the operation and this loss must be replaced by adding distilled water. Never add acid. Once every 2 weeks unscrew the filling plugs and observe the height of the electrolyte. If below the bottom of the filling tubes add pure, distilled water, bring the liquid up to the proper height—level with the bottom of the filling tube. Ordinarily it will require only a tablespoon or so of water. In hot weather it may require more, but keep it up to this point. The filling plug must be replaced and screwed down tightly after filling.

If a plug is left out, or loose, the solution may flow out of the cell, especially when the battery is being charged. If a plug is lost or broken, obtain a new one at once. The water for filling the batteries must be pure distilled water, melted artificial ice, or fresh rain water.

Never keep the water in metal containers, such as a bucket or can. It is best to get a bottle of distilled water from your druggist, or an ice plant. A quart will last a long time. The whole point is to keep metal particles out of the batteries. Spring water, well or hydrant water from iron pipes generally contains iron and other materials in solution, which will ultimately cause trouble if used.

If electrolyte has been spilled from the cell, replace the loss with new electrolyte and follow with an overcharge by running the engine for several hours, or charge the battery from an outside source.

The specific gravity of the electrolyte to be used for replacing the loss when spilled from the cells, or due to broken jars, should be the same specific gravity as that of one of the adjacent cells. This can be determined by the use of the hydrometer syringe.

The proper specific gravity of the electrolyte, when the battery is fully charged is 1.280, as indicated by the hydrometer syringe, but a variation of from 1.270 to 1.290 is allowable. Never add acid or electrolyte to the cells except to replace loss by spilling, a broken jar or when removing sediment.

When new electrolyte is required, either to replace loss from spilling or when removing sediment or replacing a broken

jar, it can be made by mixing chemically pure sulphuric acid of 1.840 specific gravity, and distilled water, in proportion of one part of acid to three of water, by volume.

The acid must always be poured into the water, and not the water into the acid. A glass, earthenware or other acid-proof vessel, thoroughly clean, should be used for mixing, and the electrolyte allowed to cool before using. If a lower specific gravity than 1.280 is desired, more water should be added to the acid.

2—If the above directions are followed there is no danger of breaking the battery jar when the mixture is poured in.

3—This depends upon the condition of the battery. If, when the electrolyte is of the specific gravity of 1.280, the voltage is not as high as it should be; or, if the lamps have been burning dimly or the starting motor seems weak, it is well to charge. This may be done by running the engine for some time until the battery is recharged; or, the charging may be done from an outside source.

GIVES REASON FOR EASY RIDING

Reader Considers Movement of the Frame
—Refers to Previous Article

Plover, Ia.—Editor Motor Age—In Motor Age for April 2 on page 32 you explain the reason why a roadster with the seat in the center rides easier than one with the seat at the rear, both having the same spring suspension. It does not look as though this was explained fully enough.

My idea is that with the same spring suspension the springs would be disregarded and only the movement of the frame considered. Then, as in the illustration, when the rear wheels were thrown up, a person sitting near them would be raised higher than one in the middle of the frame and therefore receive more of a jolt. The frame, however, would not have enough spring in it to affect the jolt

one way or the other. The illustration explains why the rear seats are not as easy riding as the front seats.—L. E. Garlock.

COOLING SURFACE NECESSARY

Method of Calculating Effective Radiating Area—Capacity Required

Chicago—Editor Motor Age—How many square inches of cooling surface does it take to cool an engine?—J. Breen.

The number of cubic inches radiator capacity required per horsepower largely depends on the construction of the radiator, the same radiator capacity not being used in cellular types that has been adopted in tubular. In fact, tubular radiators have not all the same water capacity because of the different cooling co-efficients of them, due to the more or less effective radiating fins or flanges carried on the tubes. A definite idea of the cooling capacity of the tubular type may be obtained from the course pursued by the Long Mfg. Co., Detroit, maker of a spiral fin tubular type radiator. For a four-cylinder motor with 5-inch bore and 5-inch stroke, the method used in determining its radiator capacity needed is as follows: Multiply the cylinder diameter by the piston stroke by the number of cylinders. In this case it is 100, and the company uses 100 linear feet of its 3/4-inch tubing for such a motor. Should the tubing be 5/8 inch, then 200 feet is needed. One foot of the 3/4-inch tubing has 210 square inches of cooling area on the spiral fins, and 1 foot of the 5/8-inch tubing has 124 square inches cooling area. This gives practically 20,000 square inches cooling area for a 5 by 5 four-cylinder motor, which, according to the A. L. A. M. rating, would be 40-horsepower. This carried still further would give practically 500 square inches of radiating area per horsepower. From another point of view the 100 feet 3/4-inch tubing would contain 520.4 cubic inches of water, which works out practically 13 cubic inches per horsepower. If the radiator is of the cellular construction different figures apply.

Maker of Marvel Carburetor

Lawrence, Kan.—Editor Motor Age—What carburetor does the 1914 Buick six use?

2—Give name and address of the manufacturer.

3—Is this carburetor electrically heated? If so, kindly explain by means of diagram how it is connected to the battery.—R. P. K.

1—Marvel carburetor.

2—Marvel Carburetor Co., Flint, Mich.

3—This carburetor is not heated by electricity but a lead is taken from the exhaust pipe so as to supply warm air.

Is Kerosene Motor Successful?

Mt. Carmel, Ill.—Editor Motor Age—Do American annular ball bearing makers use domestic or foreign balls for their races?

2—Does the Oldsmobile still use the 42-inch wheels on the big cars?

3—Is aluminum as easily fused and hardened as babbitt?

Questions Answered and Communications Received

R. B. Graham.....Clay Center, Neb.
L. E. Garlock.....Plover, Ia.
J. Breen.....Chicago
R. P. K.....Lawrence, Kan.
X. Y. Z.....Mt. Carmel, Ill.
George Chapman.....Cadillac, Mich.
A. Reader.....Anderson, Ind.
W. W. Graves.....Lake, Miss.
W. R. Kent.....Olauste, Okla.
W. F. Briard.....Gaylord, Minn.
W. T. Church.....Chicago
Howard Mills.....Champaign, Ill.
George R. Bent.....Oglesby, Ill.
A. D. Carpenter.....Sauk Center, Minn.
E. I. Beistle.....South Bend, Ind.
W. F. Schaphorst.....New York
J. H. Campbell.....Lorain, O.
W. A. Walpole.....Irrigon, Ore.

No communication not signed with the reader's full name and address will be answered.

4—Is the kerosene-burning motor gaining any headway? What are its advantages?—X. Y. Z.

1—Most of them make their own balls.

2—No, the six uses 36 by 5-inch wheels.

3—No.

4—The kerosene motor is a reality, as was demonstrated by the recent world tour by a Henderson car equipped with a Harroun kerosene carbureter. Greater power and economy are the chief claims for kerosene engines.

OIL LEAKS FROM CLUTCH TO GEARS Leaky Bearing Probable Cause—Block Passage Between Housings

Cadillac, Mich.—Editor Motor Age—I have an Elmore car with a multiple-disk clutch and gearbox fastened together just behind the flywheel and so connected that the oil will flow from the clutch to the gears or vice versa. If I put grease in the gears it seems to melt or turn into a liquid and work out in some way. I find that if I fill the clutch up with oil above the shaft bearing it will run out in quite a stream until it gets below said bearings but cannot understand how the balance of the oil gets out. It does, and leaves the clutch dry and then of course it will grab.

2—Is it possible that the revolving of the clutch works out the oil through the same bearing? What is the cause of the grease changing to a liquid?

We get the best results by using a heavy motor oil in both cases, but it gets out in some way. The gearcase is somewhat lower than the clutch case and all the oil runs from the clutch case to the gearcase and leaves the clutch dry. Would it be advisable to close up the passage between the clutch and gearcase and use grease for the gears? Does Motor Age think it gets hot enough to melt the grease and if so what would cause it to do so?—George Chapman.

1—The oil is thrown to the outside by centrifugal force and evidently works out through the shaft bearing. When you allow the oil to drop below the shaft bearing level, it does not remain there but is thrown around continually. Look to the shaft bearing.

2—The grease changes to a liquid because of the heat generated in the gearbox and clutch. Heat thins the lubricant and that is why a heavier oil usually is used in summer than in the cold months.

In many types of combination gearset and clutch constructions the cases of both clutch and gearset communicate, and oil placed in one may work out into the other. In your case it appears that there is a leaky bearing in one or the other housing and all that would be necessary would be a careful examination of the parts and the possible replacement of those worn. If you can successfully block the passageway between the clutch and gearset cases it would be a good idea to do so and then the gears could be fed proper gear lubricant and the clutch a mixture of lubricating oil and kerosene.

THE MEANING OF PISTON SPEED Refers to Velocity of Any One Piston— Concrete Example Given

Anderson, Ind.—Editor Motor Age—How many pounds should a magnet of a Bosch motorcycle magneto, 1909 model, type DAV, pick up?

2—How much should the primary current be, in volts and amperes, at 100 r. p. m.?

3—Supposing a coil is 100 per cent efficient, and if there are 10 times as many turns of secondary as primary, would the secondary voltage be ten times that of the primary, and the amperage be one-tenth that of the primary?

4—Can Motor Age give the names of some books on induction coils, high and low-tension magnetos and other apparatus pertaining to ignition. One which goes into the theoretical as well as the practical part of it.

5—At what r. p. m. are readings of the generator taken, I mean the type used, as for instance, one reads of a system using 6-volt, 80-ampere?

6—In some specifications one sees the claims of horsepower at a certain piston speed per minute. Do they mean the speed of the pistons during their power strokes or of all the strokes going up and down too?—A Reader.

1—Between 12 and 18 pounds.

2—About 3 volts.

3—Yes.

4—The following named books will suit your requirements: "Electric Ignition for Motor Cars," published by the Car Illustrated, London, Eng.; "Ignition Timing and Valve Setting," by T. H. Russell and published by Charles C. Thompson, Chicago; and "Induction Coils by Norrie," published by Spon & Chamberlain, New York.

5—A generator which is called a 6-volt, 80 ampere, is one which has a normal output of 80 amperes at its normal voltage, which is six.

6—The piston speed refers to the speed of any piston. Let us take a motor with a 6-inch stroke. Each piston will travel upward once and downward once for each revolution of the flywheel and hence one revolution of the flywheel causes the piston to travel two times 6 inches or 1 foot. At 1,000 r.p.m. of the flywheel each piston will travel 1,000 times 1 foot or 1,000 feet per minute, at 2,000 r.p.m., the pistons would have a speed of 2,000 feet per minute.

An Odd Car Ailment

Lake, Miss.—Editor Motor Age—Kindly tell me what is the trouble with my Ford model T. When the pedal is pressed forward into slow speed the engine chokes down and will not pull at all unless it is running at a very high speed?—W. W. Graves.

The carbureter mixture may be so poor as to have little pulling power at slow speed. This would cause the motor to stall when the load is applied. The low-speed band may be binding on its drum and cause the trouble. Motor Age is of the opinion that either the carbureter or ignition of the motor is at fault and if you will check these up you will find the cause.

Corrects Reader's Design

Olustee, Okla.—Editor Motor Age—I have been making a Ford rebabbitting jig for connecting rods, according to W. H. McCulloch's instructions in February 19 issue. After making the pieces I find they do not go together as they should. The width of the babbitt liner should be $1\frac{1}{2}$ inches or $1\frac{3}{8}$, and when I put the pieces together it only leaves a space of $1\frac{1}{2}$.

I think Fig. C should be $2\frac{5}{8}$ inches long instead of $2\frac{1}{8}$, or Fig. B at the $1\frac{1}{2}$ -inch

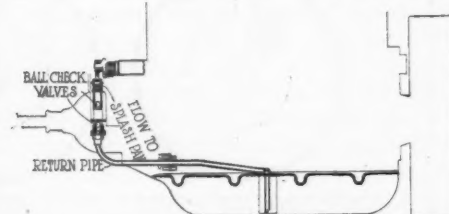


FIG. 1—OILING SYSTEM OF MAXWELL 25-4
The system is called splash, as it is assisted by a plunger pump. The details of the operation are given in the text

bore should be $\frac{1}{8}$ inch deep instead of $\frac{3}{8}$ inch deep. I am making a washer $1\frac{1}{2}$ inches in diameter $\frac{1}{4}$ inch thick by $\frac{1}{2}$ inch to fit in Fig. B and think it will make a good outfit.—W. R. Kent.

Error in Starter Make

In the April 16 issue of Motor Age, on page 26, it was stated the Studebaker four is equipped with a Westinghouse starting and lighting system. This is an error, as the Studebaker four is equipped with the Studebaker-Wagner starting and lighting system, which is a decided feature on a car selling at \$1,050.

LUBRICATION OF MAXWELL MOTOR Splash Assisted by a Plunger Pump— Magneto Trouble

Gaylord, Minn.—Editor Motor Age—How is the motor of the new Maxwell 25-4 oiled? Kindly show by diagram.

2—What is the best oil to use, light or heavy?

3—Where could a person look for trouble when a new Simms magneto refuses to deliver a spark? The wiring is perfect, breaker points are bright and about .015 inch apart. I have tried different breaker point openings, but with no better results.—W. F. Briard.

1—The Maxwell 25-4 motor is oiled by splash. The system comprises a plunger pump, and a splash pan into which the connecting rod dips. The oiling system is shown in Fig. 1. The crankcase is filled to level with oil and this oil is scooped up by the connecting rods and splashed to the working parts. All excess oil and that which has splashed falls to a sump shown in the illustration, from which it is pumped and again fed to the splash pan.

2—A medium grade is best suited for the Maxwell 25-4.

3—If the breaker points are properly adjusted and clean, the distributor is clean and not oiled too much and the wiring is correct, one may look to the spark plug gaps. These may be too wide to accommodate the magneto voltage. If the magnetos have been removed have they been replaced with like poles on one side, that is, the N poles on one side and the S on the other. Some place the magnets so that an N and an S pole are on the same side, which may cause a poor spark or none to be given. The magneto may be giving a spark and the motor not fire because of improper magneto setting. If you will tell Motor Age more about the case a better answer can be given. Is the magneto installed in a car? Has it been removed? What has been done to it so far?

STORING OIL UNDER THE GROUND Not Unless Proper Tank and Venting Is Provided—Laws Interfere

Chicago—Editor Motor Age—Is there any reason why lubricating oil should not be stored in a tank buried in the ground under the garage floor, and pumped therefrom as needed?—W. T. Church.

There is one important reason for not storing lubricating oil under the ground unless care is taken to place the lubricant in the proper kind of tank with a suitable vent, and that is, that the oil may give up gases. These gases form and if no outlet is provided the continued expansion may cause the tank to explode. It should be remembered that not all oils break up

and cause dangerous gas to form, but many of the oils on the market do show that characteristic. The laws in the large cities make it imperative that certain kinds of tanks be used, with proper venting.

Information on American Car

Champaign, Ill.—Editor Motor Age—Kindly give me the name of a concern which handles parts for an underslung American.

2—What motor, transmission and rear axle were used on the 1909 American?

3—What are the smallest wheels that could be put on it so the clearance would be ample?—Howard Mills.

1—Parts may be obtained from the Levene Motor Co., Philadelphia, Pa., and Auto Parts Co., 739 Jackson boulevard, Chicago, Ill. Parts also are handled by a number of concerns which will be found in the Clearing House department of the advertising pages of Motor Age.

2—The motor, transmission and rear axle on the car mentioned were made by the American Motors Co.

3—It seems for the roads in central Illinois that the clearance is not excessive with the present wheels.

TWO AND FOUR-CYCLE ENGINES

Structural Comparisons—Operation of Each Type Given in Detail

Oglesby, Ill.—Editor Motor Age—What is the difference between a two-cycle and a four-cycle motor? Explain the working of each.

2—How is the Franklin air-cooled engine different from a water-cooled and why is it so economical in fuel?

3—How many miles per gallon should we get from our 1913 Cadillac? The country is hilly and we average about 20 miles per hour. At present we get from 7 to 9.—George R. Bent.

A cycle in general is a series of events occurring in succession which goes to make up a complete operation. Some engines take more strokes to complete their cycles than do others. By far the greatest proportion in motor car practice require four strokes of the piston between explosions; that is, the piston travels up twice and down twice, making two revolutions of the crankshaft between explosions. These have come to be called four-cycle engines. There are others which take only two strokes, one up and one down; that is, one revolution of the crankshaft to complete the cycle. These are called two-cycle engines.

The four operations of a four-cycle engine are shown in Fig. 3. When the piston starts to go downward the mechanically operated intake valve opens and thus allows the piston to suck mixture into the cylinder, as shown at the extreme left of the illustration. The next illustration shows the piston starting to go upward. At this point both intake and exhaust valves close, for otherwise the mixture would be pushed out. When the piston gets to the top the mixture is fully compressed and at this point the explosion takes place and throws the piston downward, as shown in the next illustration. Both valves are still closed. When the piston gets almost to the bottom of the explosion or power stroke the exhaust valve opens, the piston starts upwards and thus pushes the burned gas out. The cylinder is now ready to again receive a fresh

charge, which it gets when the piston goes down again.

There are two kinds of two-cycle engines, one called the two-port and the other the three-port, so-called from the number of gates or ports in the cylinder by which the gas is let in and out. Fig. 2 shows the three-port type of two-cycle engine.

In the two-cycle engine we simply make the crankcase air-tight and let it do some of the work of getting the charge ready for firing. The crankcase acts as the chamber into which the fresh gas is drawn from the carburetor by the piston on each up-stroke, and from there it is forced into the cylinder above the piston through a by-pass on each down stroke of the piston. Consequently, there is a charge ready for firing whenever the piston reaches the top of its stroke.

Fig. 2 illustrates the way this is accomplished in the three-port type of two-cycle engine. In the left-hand figure there are two ports on the right side of the cylinder, the lower one, the inlet port, being simply a hole through the cylinder wall which allows gas to pass from a carburetor on the outside to the crankcase below the piston, whenever the latter does not cover up the hole. A few inches above the inlet port is the exhaust port, which opens the combustion chamber to the muffler—when not covered by the piston.

On the left side of the cylinder wall there is seen an L-shaped passageway opening at its lower end to the crankcase and at its upper end to the cylinder about opposite the exhaust port. This is a second inlet port and the vertical passage is called the by-pass or transfer passage by which the fresh gas is passed from the crankcase around the piston and into the cylinder above the piston.

The figure on the left shows the condition of things just before a spark occurs. The piston is almost at the top of its stroke; it is compressing the gas in the combustion chamber, and at the same time

has been creating a suction in the crankcase, so that when the lower edge of the piston passes the gas inlet port on the right, gas is drawn into the crankcase by the suction.

When the piston reaches the top of its stroke, the spark occurs, the explosion drives the piston down, compressing all the gas that has been drawn into the crankcase. When it gets most of the way down, the top edge of the piston uncovers the exhaust port and the burning exhaust gas rushes out of the cylinder. The middle illustration shows the exhaust port just opening. By the time the piston is down far enough to open the exhaust port fully it has begun to open the second inlet port on the other side, allowing the gas which is being compressed in the crankcase to rush through the transfer passage or by-pass into the combustion chamber as illustrated at the right. By the time the piston gets back to near the top of its stroke, it has covered up the second inlet port and the exhaust port and has compressed the gas in the top of the cylinder and is about ready to fire again.

On the top of the piston will be noticed a plate sticking up into the cylinder. It is called a baffle plate and simply deflects toward the top of the cylinder the fresh gases entering from the by-pass so that they will not get mixed with the exhaust gases and be drawn out the exhaust port with them. The screen shown prevents flame shooting into the crankcase.

There is another type of two-cycle engine known as the two-port, which more nearly resembles the four-cycle engine. Although this latter type operates upon the two-cycle principle, it has an intake valve very much like that used on four-cycle engines. The transfer of the gas from the crankcase to the cylinder and the exhaust valve are similar to those of the three-port type.

2—The Franklin engine fundamentally does not differ from the water-cooled type.

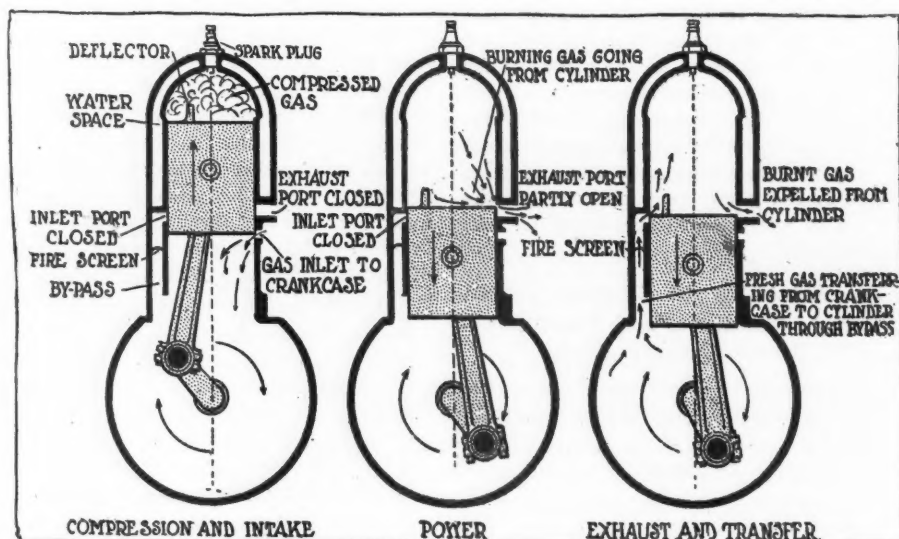


FIG. 2—OPERATION OF A TWO-CYCLE MOTOR

The above illustration shows the three-port type and the lower port on the right is the intake to the crankcase, while the port above it is the exhaust. The intake port to the cylinder is shown at the left of the casting. The operation is described fully in the text.

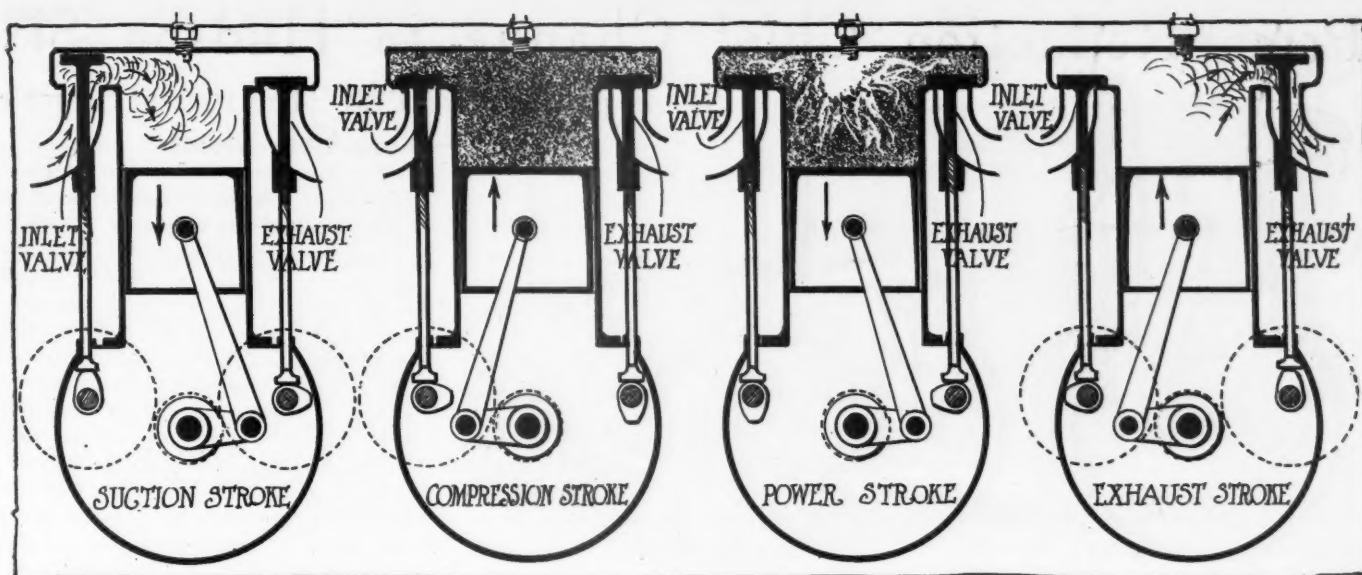


FIG. 3—FOUR-CYCLE MOTOR OPERATION

The successive strokes, intake, compression, power and exhaust are shown above with the valve positions in each case. The dotted circles are made to represent gears, the large ones for the camshaft and the smaller one for the crankshaft

The pistons, crankshaft and other parts are conventional, but, of course, the cylinders have cooling flanges instead of water jackets. The economy is obtained, it is stated, because the engine can work at a higher temperature than the average water-cooled engine. The Franklin works at a temperature of 325 degrees, while the water-cooled cannot go above 212, the boiling point of water. Another reason for the high mileage per gallon of the Franklin car is the light weight of the vehicle, which is 2,750 pounds with complete equipment.

3—Nine miles per gallon should be a good figure for hilly country work. However, some of the 1913 Cadillacs show an average of 10 to 12 miles per gallon.

READER DIAGNOSES CAR AILMENTS

Tells of Some Experiences With Ignition Timer and Gasoline Line

Sauk Center, Minn.—Editor Motor Age—A friend called on me the other day and asked me to go home with him and see, if possible, what the trouble was with his car which had caused him no end of trouble and vexation. My thoughts were along the spark plug line, but this time the plug was not in fault. The machine would run well at times and then misfire badly. I put it through the usual trouble-finder's work, but still it would run unevenly, and although I replaced the faulty plug with a new one still it would misfire. I finally concluded the trouble was in the timer and found upon examination that in an unaccountable manner dirt had gotten into it through the oil hole on top and caused cylinder No. 2 to misfire. I removed the obstruction and as expected the motor operated well.

At another time I was asked to look over a big machine which had come in with a low gasoline level in the tank and on filling up the tank with 20 gallons of fuel it refused to start, either on battery

or magneto. In some unaccountable manner the set screw which locks the gasoline supply valve, which permits the right amount of gasoline to enter the carburetor, had jarred loose and a small stream of gasoline was running into the already flooded carburetor and thence onto the ground. I shut off the cock at the tank, adjusted the valve, cranked the motor and it started.—A. D. Carpenter.

Suggest Oxygen for More Power

South Bend, Ind.—Editor Motor Age—As manufacturers and drivers of racing cars are doing many things to increase the speed of their cars, they can still add more speed and power to the same car by increasing the amount of oxygen in the mixture. This can be done by connecting a tank of oxygen to the intake manifold, with suitable valve to reduce pressure from the tank, and using it the same as extra air. As surplus oxygen favors more rapid and complete combustion, naturally there will be more speed and power, also less carbon.—E. I. Beistle.

According to the A. A. A. rules no oxidizing agent is permitted in the fuel.

SAYS AIR-CLEANER IS NEEDED

Instrument to Remove All Dirt from Air Before It Reaches the Carburetor

New York—Editor Motor Age—I am convinced that there is a good opportunity in the motor car field for the manufacture of a good air-cleaner, to take dust out of the air before it reaches the carburetor. In a recent experience where one of the best carburetors on the market was used, dust clogged the valves so badly that much trouble was experienced until the dust was found and cleaned out. Experts for the carburetor company contended the fault was not with the carburetor and refused to look at it until the car owner insisted they should do so. When air is taken directly

from the open, right back of the radiator fan, the dangers from dust are many.

There are so many successful steam separators, strainers, etc., on the market for other purposes that I can see no reason why a good one could not be made at low cost for motor car use. It is necessary, of course, that such a cleaner have practically no frictional resistance. The dust could be taken out either by centrifugal force through labyrinth passages or by means of a strainer. The centrifugal force method appeals to me as being the most satisfactory and practical.—N. F. Schaphorst.

Hint on Motor Timing

Lorain, O.—Editor Motor Age—Kindly explain the setting and timing of a Studebaker 30, 1912, known as the E-M-F, as I cannot get the valves to work as the flywheel is marked. The motor works pretty good, but has too much vibration.—J. H. Campbell.

Get No. 1 piston on top dead center and then mark the flywheel at a point opposite the center of the last cylinder. Call this top dead center and the opposite side of the flywheel bottom dead center. The intake should open when the mark on the flywheel is 2 inches past the center of the last cylinder and close when the mark is 7 inches past. The exhaust should open 6 inches before lower dead center and close 1 inch after top dead center. The inches are measured on the flywheel.

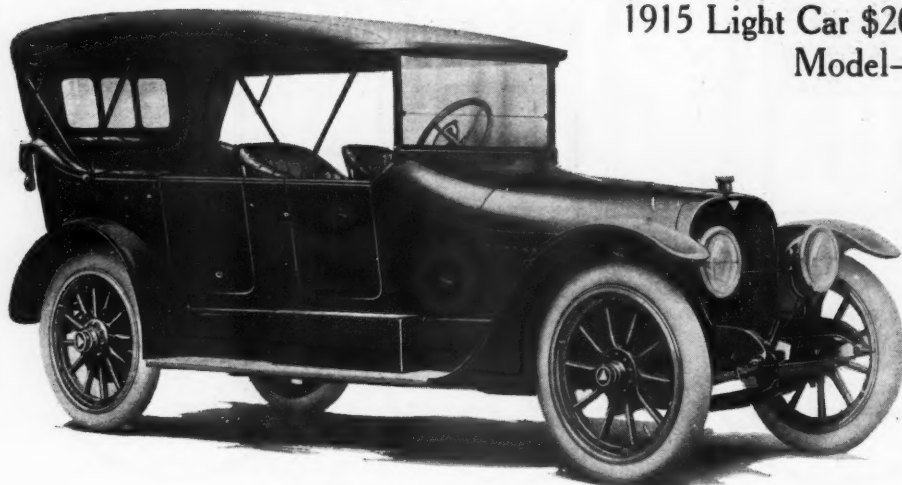
Car Weight and Sand

Irrigon, Ore.—Editor Motor Age—How heavy should a car be that is to be used almost entirely in deep sand? Is 2,400 pounds too heavy? Supposing a car to be a five-passenger, four-cylinder, 32-horsepower model, with 104 in. wheelbase, L-head motor, 3 1/4 by 5 1/4 inch bore and stroke, geared 4 to 1, with 33 by 4-inch tires. Could Motor Age suggest specifications which would be more suitable for heavy livery work in a sandy country?—W. A. Walpole.

The lighter the car the less tendency to sink into the sand. The specifications you give are good for a five-passenger car and it would be hard to find a large five-passenger vehicle to weigh much less.

Price Reduction Chief Change in Hudson Six

1915 Light Car \$200 Less Than Present Season's Model—Block-Cast Motor



HUDSON 6-40 PHAETON FOR 1915

THE Hudson light six-cylinder car is now in its second year, and for 1915 it presents little mechanical change or alteration in outward appearance.

However, the announcement of the 1915 model of this Six-40 Hudson carries with it one very important feature, and that is a material reduction in price of the car. Two hundred dollars has been clipped from the figure, making the touring car and roadster procurable for \$1,550, the convertible roadster for \$1,750, the coupe for \$2,150 and the limousine for \$2,550. The factory points out that this reduction is made possible by an increased production over that of the 1914 season, the new Six-40 being even more refined than the preceding model.

Besides the price, the most important changes have been in the motor and chassis, although even these are minor alterations and do not affect in any way the general mechanical layout. Several slight changes have been made in bodies to afford even greater comfort for the passengers.

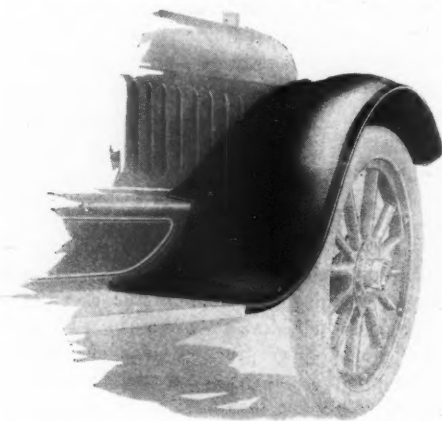
The wheelbase of the car remains at 123 inches and the total weight is about the same as it was—2,980 pounds. If anything, however, this is slightly less than formerly, due to some detail changes.

Block-Cast Cylinders

Though still having a bore of $3\frac{1}{2}$ inches and a stroke of 5 inches, the new car's engine is now a single block casting for the six cylinders, instead of having them in threes, as formerly. No difference in the general overall length of the power plant and gearset, which is in unit with it, is made by this change of cylinder casting.

The L-head construction with the valves all on the right side and enclosed by two cover plates is adhered to, but the casting of the cylinders all together has made it possible to eliminate an intake manifold entirely. On the 1914 motor, the carbureter was placed on the right side, with a two-branch manifold leading to the cylinder blocks. On the 1915 type, the carbureter is shifted to the left side and its

flange bolts directly to a single opening in the casting midway of its length. Thus the gas passages to the individual cylinders are cast in the cylinder block and lead across through the jacket spaces to their respective valve parts. Consequently the gas pas-



CROWNED FENDERS ON NEW HUDSON

sages to the cylinders are entirely surrounded by hot water, the additional heat obtained in this way aiding in the vaporization of the fuel.

Another point aiding the carburetion is the manner of getting air to the carbureter.

The air intake connects through a tube with an opening cast in the top of the cylinder block. This runs

FEATURES OF NEW HUDSON SIX

Price reduced \$200—Now \$1,550

Motor now block casting

Cylinders, $3\frac{1}{2}$ by 5

Nickel-steel valves, interchangeable

Integral intake manifold.

Wheelbase, 123 inches

Delco ignition, lighting and cranking

Disk clutch

Hollow driving shaft

across to the right side, where its far end is open. Due to the proximity of this opening to the hottest part of the exhaust manifold, the passage gets the hottest air and conveys it across through the upper part of the water-jacket to the carbureter intake. The Zenith carbureter is used.

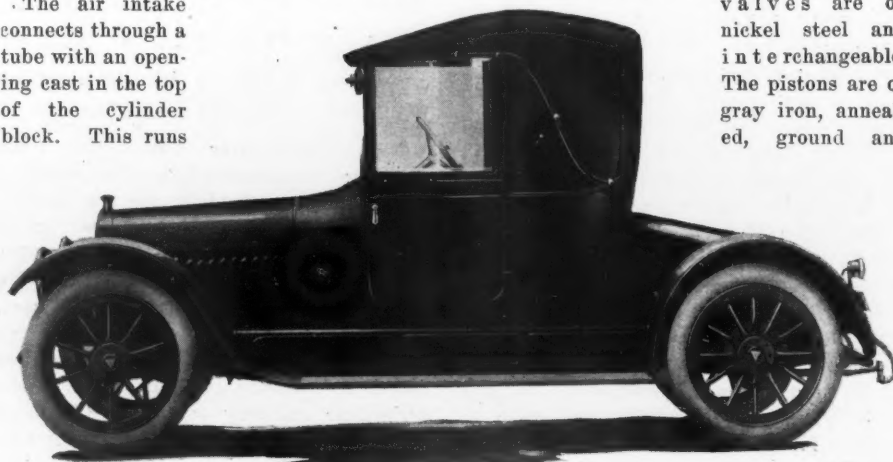
Motor More Powerful

Due to a finer balance of the reciprocating parts, to a stronger crankshaft, which, though still supported on three large bearings, is $\frac{1}{8}$ inch larger in diameter, and to the resulting fact that the engine is smoother in action, an increase in power is claimed for it. The output is from 40 to 47 horsepower under ordinary conditions. Connecting rod bearings have also come in for some of the enlargement, being now 2 inches in diameter, as against $1\frac{3}{8}$ inch heretofore.

All reciprocating parts have been made as light as possible to be consistent with the work they have to do, and this is, of course, another enemy to vibration. Due to an alteration in the design of the helically cut timing gears, they also have been rendered quieter and more efficient.

No departures from the conventional are in evidence in the working parts. The

valves are of nickel steel and interchangeable. The pistons are of gray iron, annealed, ground and



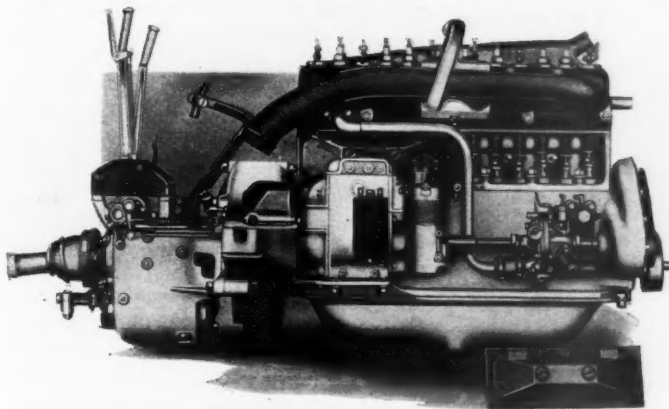
HUDSON CONVERTIBLE ROADSTER-COUPÉ

lapped into their respective cylinders; wrist pins are of nickel-steel tubing, hardened and ground, and are press fitted in place and held by set screws; connecting-rods are made of a special steel of the usual I-beam section; the crankshaft is forged and heat treated and its throws are shaped so as to balance; the camshaft is forged with its cams integral and is hardened and ground.

Engine Details

As heretofore, the lower half of the crankcase is made of pressed steel, although the upper part is of aluminum and carries the three crankshaft bearings independently of the lower part. From the sides of the crankcase pressed steel aprons run to the side frame members, preventing mud and dirt from getting above the frame and onto the engine apparatus. This construction eliminates a mud pan under the power plant and has the special advantage that the oil reservoir in the lower part of the crankcase is exposed, insuring better cooling of the oil, which is an aid to efficient lubrication. This feature, however, as well as the constant level splash system of oiling, were used on the 1914 car.

In the cooling system one change has

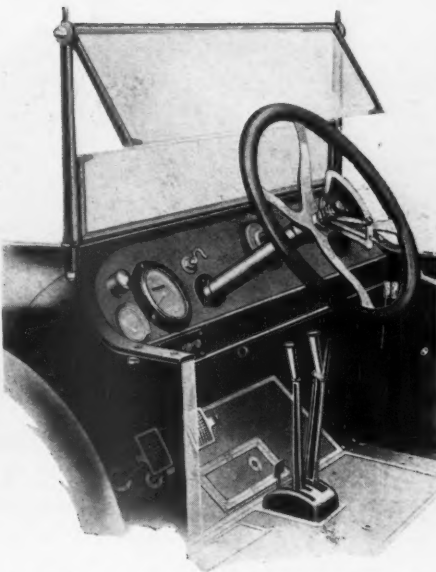


HUDSON 1915 ENGINE SHOWING DELCO DISTRIBUTER AND COIL

been made. An improved type of honeycomb radiator of large cooling capacity replaces a less efficient one of the same type. Water is circulated by a centrifugal pump of ample size, driven by a shaft on the right side of the motor.

All electrical functions continue to be provided for by a combination Delco cranking, lighting and ignition system. The motor generator unit with which the ignition distributor is an integral part is carried on a crankcase bracket on the right side of the engine and close to the flywheel. As a generator, the device is driven in the usual way by an extension of the pump shaft. When operating as a cranking motor, it drives through a set of gears housed within the right arm of the crankcase. The flywheel rim is provided with teeth for the purpose.

When operating as a generator, the ratio of engine speed to generator speed is 1 to 1.25, and as a cranking motor, the electrical unit runs about 23 times as fast, due to the two reductions in the gear train. To mesh



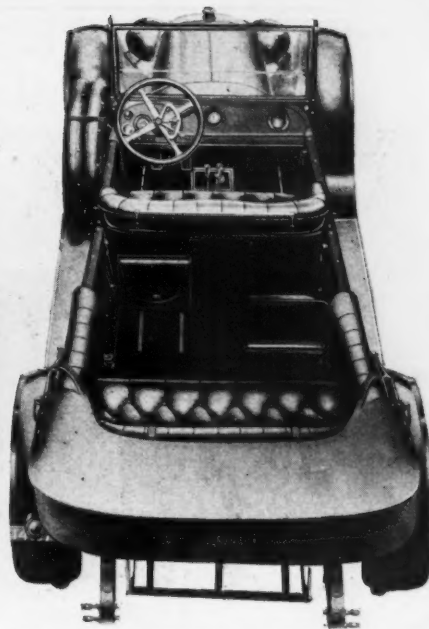
CONTROL BOARD ARRANGEMENTS OF HUDSON

the gears for starting, a small pedal close to the center control levers is pushed. This slides all gears into mesh. At other times, none of these are meshed, hence noise is eliminated.

The Delco system now fitted is somewhat simplified over last year. A circuit-breaking relay for detecting short circuits in the wiring now is provided instead of the fuse box. All wiring is greatly simplified. The wires run in rust-proof, flexible metal conduits closed at the ends

and anchored against chafing and rattle. none of these are meshed, hence noise is eliminated.

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BIRD'S-EYE VIEW OF HUDSON SHOWING SEATING ARRANGEMENT

simplified over last year. A circuit-breaking relay for detecting short circuits in the wiring now is provided instead of the fuse box. All wiring is greatly simplified. The wires run in rust-proof, flexible metal conduits closed at the ends and anchored against chafing and rattle.

Automatic Spark Advance Added

In the ignition part, a noticeable refinement is the addition of automatic spark advance in combination with the regular spark advance by lever on the steering wheel quadrant. This automatic advance might be said to work above the hand advance. That is, supposing the lever to be set for any position of advance, the automatic then adjusts the sparking accurately to fire within certain range of the set position.

A positive lock has been provided on the ignition and lighting switch which makes it impossible to lock the switch before the engine has been stopped. Any combination of lights may also be locked in position. The car carries the same storage battery



NEW HUDSON 6-40 ROADSTER



One of the busiest gasoline stations of the Central Oil Co.—at Woodward and High streets, Detroit, Mich.—200 to 300 cars get supplies there daily

as before—a 100 ampere-hour Exide battery.

The multiple-disk clutch contained in an oil-tight case in the flywheel has not been altered, and the gearset, which is in unit with the engine, also is the same. There are three forward speeds and all shafts run on roller bearings. Practically the same method of mounting the control levers on top of the gearbox is adhered to and provision for getting at the gears is provided.

Hollow Drive Shaft

Hotchkiss drive through the rear springs still is used, and is perhaps the simplest construction possible. Instead of torsion tube or torsion arm, the master leaves of the two rear springs are made strong enough to take the torque and drive. Last year's peculiar drive shaft, which had a varying cross section, being largest in diameter at the center and tapering to the ends, has been replaced by a hollow steel shaft, which is lighter than the solid type though equally strong.

Besides eliminating considerable weight on the axle bearings and the transmission rear bearings, this hollow shaft is a better manufacturing proposition. The tapered shaft was difficult to make. In the new construction the ends which attach to the front and rear Spicer universals are welded to the tube, the front being the splined part and the rear being the forked portion of the rear joint. This hollow shaft also eliminates any tendency to whipping or vibration.

No change in the springing is found. The rear three-quarter elliptics measure 54 by 2 inches and are underslung from the axle. The result of this is a lower suspension of the chassis without altering the road clearance. As before, the rear springs are attached to the frame directly under the side rails. This gives no arm which

might twist the side members. Attachment is by clip and bolt. The front springs are above the axle and measure 39 by 2 inches.

The rear axle has not been changed. It is re-enforced pressed steel, the driving gears and differential being mounted as a unit and removable as such. Pinion shaft and differential case are mounted on taper roller bearings, and nickel-steel is used in shafts, gears and pinion. Fourteen by 2-inch standard brakes are used.

The tapered frame which was a feature last year still is used. This has its side members parallel for a distance of 50 inches forward from the rear, when they commence to taper inward toward the front. There is a difference of 9 inches between front and rear width, the rear being 39 inches across.

Self-Lubricating Bushings

Several chassis refinements are of special note. The speedometer drive has been removed from the front wheel spindle and is now run off the main shaft just where it emerges from the gearbox and ahead of the forward universal joint. Thus the drive is very stable and should prove a very advantageous location. It is away from road dirt and is not subjected to any vertical movement as with the old method.

Another improvement is the use of self-lubricating bushings in the steering-column tube, the front-axle cross tie rod, the yokes and the rear-axle brake shafts. These bushings are said to be much superior to the type heretofore used and, as it is not necessary to lubricate them, little trouble should be experienced from squeaks or rattles and from wear at these points. The average driver seldom, if ever, lubricates these parts, which often results in rusting as well as noise.

The gasoline tank, which is carried under the cowl, has been considerably

lightened, the fitting being now of pressed steel, which is stronger and weighs less. The tank has two partitions, to prevent the fuel from splashing sideways.

Bodies have not been changed in line, but there are several detail refinements which add to the comfort of the passengers. The windshield is the rain-vision ventilating type, and there are strong stanchions on either side to which the one-man top fastens, the separate top brackets used last year being eliminated.

The back of the front seat in the phaeton has been raised 1 inch. Along with this, the upholstery has been deepened, and by this an extra height of 1 inch is obtained so that the front seat back support is 2 inches higher than before. The rear seat back is 3 inches higher for the same reasons. The roadster seat has been increased in width, and now comfortably seats three.

Further minor improvements include the making of fender supports of pressed steel, which are lighter and stronger than the cast-iron supports formerly used. The horn button now is located in the center of the steering wheel.

COMPENSATION ACT DECISION

Detroit, Mich., June 8—In a decision rendered by the supreme court of the state of Michigan, recently, having reference to the workmen's compensation act, it was held in substance that compensation for a number of minor injuries, in the aggregate, shall not be larger than that for the permanent loss of a member, incurred in the same accident. Rather, the total sum the injured man receives shall include both the minor injuries and the complete loss. By its decision, which was written by Justice Ostrander, the court set aside a decision of the industrial accident board.

Quick-Service Gasoline Stations a Profitable City Industry

How Fuel Filling Depots Are Operated

QUICK-SERVICE gasoline stations now dot the motoring thoroughfares of many of the larger cities of the United States, notably Detroit, Los Angeles, St. Louis, Chicago and New York—a most noticeable trend of the times. Such service was originated not more than 2 years ago, but in the short space of time that it has been in operation it has flourished until now it is making considerable inroads in the business of the garagemen in the larger cities, although there are many garagemen who not only operate their garages, but also maintain these quick-service stations.

Growth Is Rapid

The growth of this movement has been rapid and in St. Louis it is said that several of the car branches and agencies have discontinued carrying gasoline, even buying their own supplies from these quick-service stations. In Los Angeles they are much in evidence, most of them being located on the boulevards, where they catch the business of those who are driving pleasure cars. In many instances they are patronized by owners who maintain their own garages, while in other cases trade comes from those who store their cars in public garages, but who are not averse to saving a penny or so a gallon by patronizing these stations which make a specialty of gasoline and oil.

Usually these quick-service stations are located on a big lot and the building erected is a small one; large enough, however, for the business. A road or path is built around the structure so that there may be no delay. A car enters from the street, is filled with gasoline, and exits by the other road.

Quick service rather than the price of the gasoline is given as one of the principal causes for the success of these stations. The first one, not only in Detroit, but in the United States, was established June 27, 1912, at Fort and First streets, Detroit, by R. L. Francis, it is said. Within a short time the station was known to about every motorist in town, and it was not long before Mr. Francis decided to open a second station. Ever since new stations have been opened wherever suitable places could be found, and at present there are about thirty gasoline and oil stations operated in Detroit by the Central Oil Co., of which Mr. Francis is president.

The stations are opened for business at 6 or 6:30 and close at 11 or 12 o'clock at night. There are stations which are more busy than others, depending upon the location, and those in charge use their own judgment about the opening and closing time. During the morning hours the stations generally are busy with commercial cars, while afternoons and evenings it is mostly the motorist who stops.

At some stations 200 to 300 cars have been supplied with gasoline between 6 in the morning and 11 at night. On Saturday and Sunday, in fine weather, as many as 400 cars have stopped at some of the stations. One grade of gasoline is sold, of 66 gravity, at 12 cents a gallon. The average supply of a car is 8 gallons, but there are cars which take on 10 or 15 gallons.

During the first summer he was in business Mr. Francis sold an average of 1,000 gallons of gasoline a day, and in January, 1913, a warehouse was opened on Waterman avenue, near the company's general offices, where a supply of 80,000 gallons is stored. The daily output is now 12,000 to 14,000 gallons a day. The gasoline is purchased by the carload, the Central Oil Co. giving specifications. Every carload of gasoline and oil is tested at the company's laboratory before it is accepted. If the standard required is not shown through the test the shipment is refused. The Central Oil Co. has no connection whatsoever with any gasoline refinery.

A Test Still

A test still at the warehouse is used for all gasoline tests and little attention is paid to gravity tests, which the company considers as unsatisfactory, eastern gasoline of 66 gravity being about equal to 58 gravity Oklahoma.

In addition to gasoline and lubricants, of which the Central Oil Co. carries a supply of 9,000 to 10,000 gallons of various grades, all the stations carry a supply of parts and

accessories, such as cement, spark plugs, dry batteries, grease, and other things which the motorist often requires quickly.

The company is using five motor trucks and has no horse-drawn vehicles. One of the tank trucks which holds 1,625 gallons probably is the largest in use in the country.

2,000 Gallons Daily

One of the largest stations in Detroit outside of the Francis string is the one managed by R. W. Kumler at Woodward and Winder streets. The station is open from 6 until midnight during the good weather. The busiest hours are from 9 in the morning till 4 in the afternoon and from 7 to 9 evenings. To supply 250 or 300 cars a day is nothing unusual, and Saturdays and Sundays up to 400 cars have stopped at the station for gasoline. At this station two grades of gasoline are sold, a high test of 64 gravity selling at 12 cents a gallon and an extra high test of 68-72 gravity selling at 15 cents a gallon. From 1,600 to 2,000 gallons are sold daily, while a supply of 2,500 gallons is always kept on the premises. Various supplies, such as tires, covers, dry batteries, carbide, cement, metal and polish cement, are kept in the station.

Memorial day was one of the best days the gasoline stations have had. Most of them opened at 6 in the morning and did not close until midnight, it being an especially fine day for motoring.



An independent filling station at Detroit, Mich. Open 18 hours a day—200 to 300 cars are taken care of daily



Cyclecar Development



Little Vehicles Growing Along Two Distinct Lines

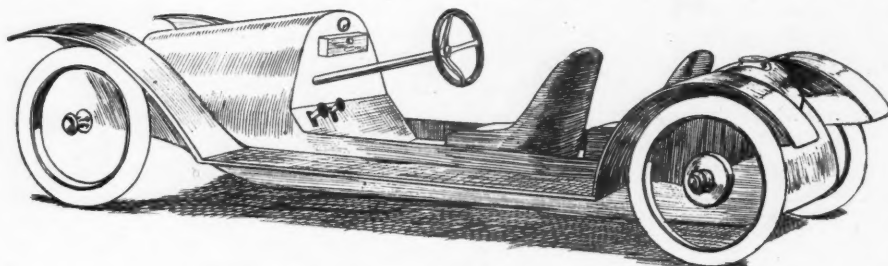


FIG. 1—MINIMUM-METAL RACING BODY TYPE WITH SEMI-TANDEM SEATING. DUST PROTECTION IS AFFORDED BY LARGE FENDERS AND RUNNING BOARDS

CYCLECAR development is rapid these days. New things are being learned every day, and constructions which give new performances are being developed by almost every sincere cyclecar factory. Starting with the minimum-first-cost idea and taking the minimum upkeep for granted, ideas have worked around to more or less subordinate the minimum-first-cost part and work for a minimum upkeep vehicle. This means all the cyclecar ideas, so far as weight, tread, motor weight, etc., are retained, but allows more substantial construction, better finish, more equipment, and greater comfort.

First cars were very cheaply built, and more cheaply finished. The mechanism was of the cheapest possible construction, and sometimes faulty through lack of factory inspection systems. In idea and layout they were good, and performed wonderfully well, but, while this was true, the details needed better working out.

The New Idea

The new idea, if it can be called new, is that one would rather pay a little higher first cost on the car provided the upkeep were less, and there were no bothersome features to be looked over and fixed from time to time. Buyers looked for motor car reliability and freedom from trouble, and expected it the first year. It is too early to expect this as yet, for it takes time to perfect any machine, no matter how clever the designers.

If there is any real reason for the present tendency toward adding mechanism it is because this for the time being is the easiest way and saves development, but those firms that develop the original idea of a very light, simple car will surely reap the reward. The public wants a real cyclecar, but a dignified one in which anyone can ride without sacrificing his pride. Such a car can be made and sold for almost the price of a motorcycle.

On the other hand, we will see the cyclecar with all the refinements of big car practice, starters, generator lighting, demountable rims perhaps, or interchange-

able wheels. Upholstery will be as fine as in a big car and the finish as elegant. Nickel and mahogany and real leather will act as an adjunct to unusual performance and quietness. These will form a different field entirely from the real cyclecar, though they may be narrow tread and light in weight. The first cost will make the difference.

Difference in Opinion

"We charge no more for our cyclecar than the others," I overheard a maker say the other day, "but we put \$50 more of material and workmanship into the machine and charge you this extra as insurance."

Every factory has its own idea as to how the cyclecar will develop. One type is convinced that a 15-horsepower four-cylinder water-cooled motor is bound to be the thing; another thinks that if the V twin is left, the whole cyclecar idea will be lost and the cars run very well with the V twin.

Others want the four-cylinder water-cooled motor, but want it under 71 inches cylinder capacity. Another factory is in favor of a four-cylinder air-cooled, another a V twin water-cooled.

Those are not absent who think the horizontal opposed motor the real type for the cyclecar and altogether there is no

one idea. The nearest to the basic thought is a minimum upkeep motor car.

In this car they want looks. They want light weight to save tire expense. They want comfort equal to a big car. They want finish and equipment as complete as on a big car. They want inclosed and weatherproof mechanisms. They want quietness. They want clean-cut design without dirt-catching flanges or oil-throwing spindles. They want a clean vehicle. They do not want the heat of the motor to bother in summer, and they want its warmth to help in winter. They want a short turning radius for city use, which means not too long a wheelbase, and yet they want a long-wheelbase comfort. They want a motor as flexible and quiet and handy as a big-car motor, and they want it to deliver more power per pound of car than in big cars. Indeed the public wants a whole lot from the cyclecar maker and designer.

Some of the things asked for cost money; others merely are the result of design knowledge and can be given for little extra cost beyond that of a good engineer. Quietness need not be costly, nor good lines on the car body. Finish costs extra and fine upholstery, but it costs no more to make a clean casting, wiped with one sweep of a rag, than a piece full of flanges and with many corners which will always look dirty.

Demand for Cheapest

While all this development and change of ideas is going on, one must not lose sight of the original fact: there is a big demand for the cheapest possible motorcar. It is possible to make reliable V-twin motors, fitted with reliable drives and simple constructions, and because cheap detailing and workmanship has discouraged some as to this type, there is yet room for a real engineer to stick to

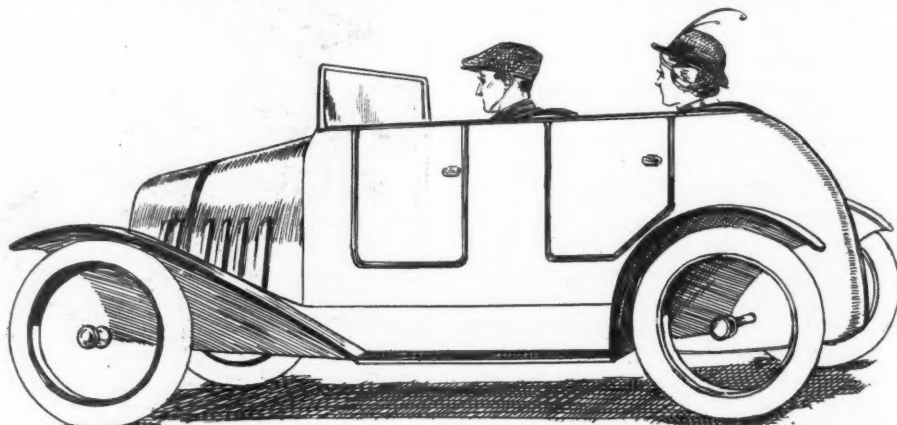


FIG. 2—THE TENDENCY TO PUT MUCH SIDE SURFACE ON CYCLECAR BODIES, SOME OF THEM HAVING MORE BODY METAL THAN TWO-SEATER BIG CARS

and develop a maximum simplicity cyclecar. It is the low-priced article with the performance that is the best commercial proposition as a rule and with this in mind, real cyclecar makers should stick to their

idea and develop what they have rather than change radically.

Cyclecar parts available are being added to daily so that one can more easily build a car today than he could a year

ago and be fairly sure of performance. What is needed most of all is motor development. Although the engines are being improved very rapidly, there is room for much betterment.



CYCLECARS HAVE DEMONSTRATION IN INDIANAPOLIS—LINED UP IN FRONT OF SPACKE PLANT

Answers to Cyclecar Inquiries from Correspondents

DESIGNING A SIMPLE TWO-SEATER Transmission and Steering Features in Question

CHICAGO—Editor Motor Age—Will Motor Age kindly give its opinion on the following specifications for a cyclecar?

1—Frame $5\frac{1}{2}$ by 2 made of ash.
2—Single-cylinder Harley-Davidson or Thor engine, battery ignition.

3—Does Motor Age think a 4-horsepower engine is powerful enough to carry two passengers, each weighing about 114 pounds?

4—Would it be advisable to have the engine in the rear, as I am having a belt running from the rear wheel direct to the engine and is tightened or slackened by an idler instead of using a clutch?

5—In this case will a leather or rubber belt have to be used?

6—Where could the gasoline tank be put if the engine were put in the rear?

7—What kind of wheels could be used for the front? The steering is going to be on the same principle as a motor boat, only instead of using cord I am going to use piano cable with spring attachment to minimize the shocks.

8—Would a brake operated by foot and acting on the rear wheel pulley be powerful enough for this car?—E. Green.

1—Too heavy, make it $5\frac{1}{2}$ by $\frac{7}{8}$ inches.

2—The main thing in belt drive is to get the pulleys and belts large enough.

3—All right for fun, but too small for real work. It would do for a single seater with narrow tread in level country.

4—Fit the motor at the rear, connected by chain to the rear axle or wheel, with a small motorcycle clutch. Gear it about 6 to 1. This you cannot do direct by V bolt, as the front pulley would be too small. See cut of Carden monocoar in Motor Age of April 23.

5—Flat leather or canvas and rubber belt will do for this. A V belt would give trouble on the small pulley.

6—In the cowl over your feet and knees.

7—Use cyclecar wheels. Do not use too light wheels, as there is great side strain on turns with the low center of gravity. You can steer by the front axle turning, but use steel piano wire cable, flexible

type, not plain piano wire, or you can use quarter-inch bicycle chain.

8—Yes. In your building, plan for low weight. Make every piece the best you know how, and even at that the first car will look amateurish. If you can copy a simple model, you will save cost and time spent in experimenting. Care in the de-



Cyclecar Demonstration

IF any doubt had existed in the minds of part of the public as to the future of the cyclecar industry, that doubt was dispelled by the showing made by this infant industry in the demonstration given under the auspices of the Indianapolis Cyclecar Club at Indianapolis, Ind., May 29. This demonstration arranged by Secretary F. S. Lawrie was part of the entertainment provided by the Indianapolis Cyclecar club for the visiting cecarists who toured to Indianapolis to attend the international speedway race.

Upon invitation, all cecarists, local and from afar, made their rendezvous at the factory of the F. W. Spacke Machine Co. The Spacke company gave what little technical service was needed, furnished oil and gasoline and washed the cars, entirely without charge.

After assembling, the cars were lined up and parade formation was made, headed by the officers of the club, and a twelve-piece band. Nineteen cyclecars swung into line and started the first public demonstration of this kind.

This honor roll of nineteen cars was made up of Comet, Scripps-Booth, Merz, Hawkins, Marvel, Smith, Brown, Scout, Mercury, Vixen and Davis cyclecars.

tails at the beginning will be found to save a great deal of trouble when the assembling commences.

Magnalium Pistons

Deadwood, S. D.—Editor Motor Age—We are contemplating a design for a two-cycle, two-cylinder, 180-degree motor 3.5 by 5, with a flywheel of about 55 pounds weight. Are there, from an engineering standpoint, any reasons why this motor could not be run at 10 to 1,200 r. p. m. satisfactorily? Are there any known conditions which would tend toward making the above mentioned proportions incorrect? I may say we intend using this motor crosswise of the frame in a small car, and as far as cooling, oiling and ample room are concerned we are all right.

2—Would the side thrust of this motor at high speed be in any way objectionable if magnalium were used for pistons?

3—Where can magnalium be purchased?—Tester.

1—This can be done, but it would be impossible to pass on the abilities of the motor without drawings. The connecting rods would need to be long and the balance perfect. Long stroke is not practiced for an opposed motor, the stroke generally being less than the bore.

2—The side thrust would not be influenced by piston material, but by connecting rod length. For the bore and stroke you mention the rods would be about 12 inches in length, making the motor about 38 inches long, a very unwieldy length.

3—Magnalium is good for small high-speed pistons if insulated from heat. Its melting point is too low for use unless you know just how to handle it. Magnalium can be purchased from the following concerns: The Aluminum Castings Co., Cleveland, O.; Harley Co., Springfield, Mass.; General Aluminum Brass Castings Co., East Grand boulevard and St. Albans avenue, Detroit, and the General Castings Co., 327 Ford building, Detroit, Mich.



Manufacturers' Communications



The Reason for the Twin Cylinder, V-Type, Air-Cooled Cyclecar Motor

INDIANAPOLIS, Ind.—The small car, new in its development in America, shows two distinct types—first, the light car, built on motor car lines, which is usually of standard wide tread, heavy weight and employs a four-cylinder, water-cooled motor. In short, an abbreviated edition of a motor car.

The other type is the cyclecar, designed on new and distinctive lines. This car always is of narrow tread, light weight, and uses a twin-cylinder V-type, air-cooled motor, together with a simple transmission, usually belt drive to the rear wheels.

The small-car movement owes its origin to the widespread demand, on the part of the buying public, for a motor vehicle of greater efficiency and consequent lower operating costs. It is generally agreed that the modern motorcycle, with all its discomfort and danger, is the most efficient self-propelled vehicle known. Since comfort, safety and cleanliness cannot be made a part of the two-wheeler, it is natural that designers in this new field, with the true principles before them, have worked out a car having the efficiency of the motorcycle, but minus its drawbacks.

Thus, as a consequence, we have the evolution of the true cyclecar, which in a sense, is a four-wheeled motorcycle, using the same general style of efficient power plant, namely, the twin-cylinder, V-type, air-cooled motor. By reason of its similarity in power plant to the motorcycle, and its general simplicity and light weight, the cyclecar is by all odds the more efficient of the two kinds of car, and meeting the demands for the utmost in operating economy, is the most popular type and presents the most fruitful field for the American manufacturer and dealer.

Since the power plant of the cyclecar is the predominating element in the success of the car, let us consider some of the features of this recognized type of motor, the two-cylinder, V-type, air-cooled motor, and why this power producer brings about the desired efficiency.

The V-type motor is, first of all, a high-speed motor, and its great power is obtained at relatively high and efficient speeds. This feature brings light weight to the motor and compactness of outline, and no material is wasted in the car design to provide for a heavy and bulky motor, as would be the case if a different type of engine were used. With light weight and compactness comes fewer parts subject to damage and renewal cost.

Then, we have successful air-cooling which from the inception of the motor car has been the hope of the designer and car owner. In the cyclecar, air-cooling is

easily accomplished, because the heat radiation of the smaller cyclecar motor can be taken care of readily. Here, again, is efficiency promoted, as the additional weight of cooling water and radiator are dispensed with, to say nothing of the repair-cost hazard involved.

In addition to these important features, however, is the most vital factor of this great quest for economy, namely: the saving of the V-type motor in gasoline and oil consumption. Were the other features omitted, this style of motor would justify itself on this point alone. No other style of power plant of equal horsepower, output and displacement can compare with it for gasoline and oil economy.

With this form of motor, and only with this, will the ideal of cyclecar designers be attained, namely: 50 miles on a gallon of gasoline and 50 miles per hour. The true cyclecar is a car of destiny, brought out to satisfy the pressing demand for the utmost in motor vehicle efficiency. The twin-cylinder, V-type, air-cooled cyclecar motor makes this efficiency possible and enables the cyclecar to fulfil its mission.—The F. W. Spacke Machine Co.

LOCATING THE MOTOR

Philadelphia, Pa.—Editor Motor Age—The reply to Mr. Parker, concerning the two-cylinder, opposed motor, in Motor Age of April 30, overlooks a few things that seem quite plain to us. Motor Age asks where the opposed motor can be put in a narrow-gage car. We solved the problem by placing it lengthwise at the rear and driving from each end of its shaft. This keeps the power where the work is to be done—a most rational placing. It keeps the weight on the drivers, and, while we do not use it so, it could be partly under the rear seat.

I disagree with Motor Age that the public prefers a motor crosswise, with the shaft running rearward. It has accepted



New Starter Concern

Louisville, Ky., June 2—With a capital of \$350,000, a company to be known as the Sampson Engineering Co. has been formed in this city to manufacture an improved electrical starter. B. B. McGraw, D. A. Caldwell and N. H. Wright are the incorporators. The company will lease a floor in the Snead Architectural building for its present purposes, but proposes later, it was stated, to erect a large factory in the city. The appliance it will manufacture is the invention of James Delano, of Indianapolis, who will be an officer of the company.

this as the best solution so far offered, but I believe it has no preference. I am certain the public will take another solution as good, or better, just as readily.

Motor Age is right in the good things it says about the opposed two-cylinder motor, but I cannot agree with it concerning the twin-vertical. Duryea vehicles of 18 years ago were fitted with twin-cylinder, block cast engines, for the good reasons mentioned, but they were not so satisfactory as the opposed type afterward adopted.—Charles E. Duryea.

WHEN THE LOSER CAN BE A WINNER

Indianapolis, Ind.—Editor Motor Age—The value of a race is in its long life. A race that ends when the first car crosses the tape is not a successful race. The best race is the one that results in the best cars for the public long after the race is run.

Racing should be a means and not an end. Racing should be a part of a factory's engineering and manufacturing processes. It should test every ounce of power and fiber of strength; it should test the principles of design and quality of materials and workmanship. Racing should be a school in which the product of the factory is made to pass examination where the engineers may study the results of their labor. Racing is the white heat of analytical tests upon the cars and the public's fair and square chance to judge manufacturer's success and sincerity.

To race merely to satisfy the sporting blood of a manufacturer with cars that in no way resemble the ones he sells, or that do not furnish practical help to his engineers, is racing for the fun of it only.

Unless the knowledge learned in racing is of practical value back in the factory, the race is short-lived. The manufacturer who enters one of his cars in a race and yet who does not finish in the lead may be the largest winner if he profits by the lessons learned by watching his car in the severe test in competition with others. If this manufacturer takes his defeated car back to his factory and there goes over it and later benefits by all that its failure taught him, he is the real winner, although he does not hear the multitudes cheering his name. His victory is genuine and will outlive that of the car that wins but stops its victory the minute the checkered flag awards it first place. The one is progress that benefits the entire industry and motor-ing fraternity. The other is temporary glory and vain waste.—George M. Dickson, General Manager National Motor Vehicle Co.



The Motorists' Bookman



Good Roads Year Book

FUNDS available in all of the states for the improvement of roads during the year 1914 are shown in the Official Good Roads Year Book issued by the American Highway Association, which is ready for distribution. This is one of the new features of the book which will make it invaluable to every state, county and municipal highway official.

The year book discloses for the first time that appropriations by the state legislatures for road improvement in the various states are available to the sum of \$62,201,016. The year book lists all of the patents relative to roads and bridges, all road expenditures in recent years, all associations' work for road improvement, describes all the different methods of road construction and different road materials, giving a directory of all road bulletins, circulars, and documents of interest to persons working for better highways and for all officials engaged in supervising work on roads. Sections of the year book are devoted to work in different states and the progress of road improvement. One of the interesting features, for instance, is the description of dust preventives, while one chapter is devoted to convict labor and another to the financial phase of road improvement. A summary of the road laws in the various states is of particular interest to motorists, while descriptions of specifications for highways in the various states will be of interest to engineers. There also is a chapter devoted to important events in the road movement in 1913, and another section devoted to road systems in foreign countries. The year book is issued annually by the American Highway Association as part of its campaign to give the United States an adequate system of improved highways. Price, \$1, postpaid.

On Old World Highways

This book of motor rambles in France and Germany and a record of a pilgrimage from Land's End to John O'Groats in Great Britain is Thomas D. Murphy's most recent contribution to travel literature. Mr. Murphy is the author of three other books of a similar nature: "British Highways and Byways from a Motor Car," "In Unfamiliar England with a Motor Car," and "Three Wonderlands of the American West." As a log of a motor tour to picturesque and historic places, "On Old World's Highways" achieves its creditable purpose. It is written in that intimate style that holds the reader's interest and adds a charm to the description of many places that have been described before. The greater portion of the volume is devoted to the tour from

Land's End to John O'Groats, through a region of ivy-covered castles, rambling old manors, ruined abbeys, romantic country seats, great cathedrals and haunted houses. In this book, as in Mr. Murphy's previous ones, the illustrations play an important part. The color plates—there are sixteen in all—are from originals by distinguished artists and the photographs have been carefully selected. The book is from the press of L. C. Page & Co., Boston, and sells for \$3 in cloth binding, and \$6 in three-quarters morocco.

Handbook for San Francisco

The motorist contemplating a transcontinental tour to the Pacific coast should find the purchase of the Handbook for San Francisco, published by the San Francisco Chamber of Commerce, an excellent investment at double or triple its price, 50 cents. Written and compiled by Frank Morton Todd, it serves as an excellent historical and descriptive guide for the visitor to the Phoenix city of the golden west. Among the features of the handbook are a list of the hotels, restaurants and cafes and grills; itineraries for a number of trips to be made in San Francisco and vicinity and a compilation of taxicab and motor car rates. The handbook is illustrated from photographs. Copies will be mailed by the chamber of commerce on receipt of price.

Motoring

To the motorists who know little about the cars they drive and find technical matters difficult to understand—and they are legion—A. E. Berriman's "Motoring," an introduction to the car and the art of driving it, is recommended for entertaining and instructive perusal. Mr. Berriman, who is chief engineer of the Daimler Co. and formerly technical editor of "Flight" and "Auto," has restricted himself to an explanation of the basic principles of motor car design and construction and has written a technical manual in a most untechnical way. Among the many subjects he discusses are the choice and upkeep of a car, touring, component parts of a car, how to drive a car, details of the transmission mechanism, brakes, suspension, the gasoline engine, the magneto, the dynamo, the carburetor, gasoline and its substitutes and the materials of which cars are made. The book is illustrated with many diagrams and photographic plates and has an appendix that should prove most valuable for reference. "Motoring" is published by Methuen & Co., Ltd., London.

Molesworth's Book of Formulae

The twenty-seventh edition of a pocket book of useful formulae for civil, mechanical and electrical engineers, called Molesworth's Book of Formulae, has just come from the press of Spon & Chamber-

lain, New York. The authors, Sir Guilford L. Molesworth and Henry Bridges Molesworth, have included in this edition all the up-to-date formulae and data for daily use by engineers. The book, which was first introduced 50 years ago, contains almost 1,000 pages and is listed at \$2.

The Light Car Manual

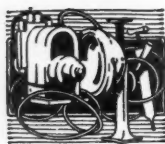
From the Temple Press, London, England, comes the book, The Light Car Manual, written and illustrated by the staff of the Light Car and Cyclecar, a foreign journal. This book specializes on the light car which has gained so much in public favor in America within the past year or more. The book is of approximately 200 pages and takes up the various light-car parts, such as motor, gearset, axles, clutches, etc., and describes and illustrates some of the prevailing types. The illustrations are good. The last chapter is devoted to the care and repair of a light car and hints are given on how to run a car economically. It sells for 31 cents in England.

Modern Gasoline Automobile

A new edition of Victor H. Page's book, the "Modern Gasoline Automobile," has just come from the publishers, the Norman W. Henley Co., New York, in a more up-to-date form than the previous edition. The new book is of 816 pages and although the same fundamentally as the older edition, has been brought up to the minute by the addition of material on the latest improvements in the motor car field.

Much supplementary matter has been added to ignition, the action of magneto generators and basic principles on which they operate. New material has been added on tractors in the three- and four-wheel forms; cyclecars; gasoline-electric drive; front-wheel and four-wheel steering systems and other important developments.

The discussion of power transmission has been augmented by the consideration of the skew bevel gear and two-speed direct drive. The subject of electric cranking systems has been considered at length and all the leading systems and their components described. A discussion on ball and roller bearings, their maintenance and installation, has also been included and a number of other features of timely interest such as the latest types of gasoline and kerosene carburetors, cyclecar power plants, the Fischer slide valve motor, detachable wire wheels, etc., have been added to bring the work up to date. Many cuts have been made to illustrate the new matter and the treatment of some of the subjects changed slightly. The book sells for \$2.50.



The Accessory Corner



Walstad Control System

A HAND control system for the clutch, gearset and brakes, which makes it possible to drive a car without using the feet, has just been announced by the Walstad Machine and Electric Co., Tacoma, Wash. By the use of this system the clutch is thrown out and the gears shifted, all the work being done by hand levers. In Fig. 2 the installation is shown on a Ford car and the maker states it is applicable to all makes of vehicles.

The device consists of three levers and a frame clamped to the steering column. From the levers three steel rods pass through the dash, to bell cranks under the hood. The movements of the latter are communicated beneath the floor to the transmission case. The lever on which the driver's hand rests in Fig. 2 is the transmission brake and the lever just above this is the clutch. The lever on the opposite side of the column actuates the reverse band.

All three levers are self-locking in any position, and self-returning when released by a slight pressure of the fingers. For example, by pushing the clutch lever from its present midway or neutral position down still farther on its segment, low gear is obtained. Spring pawls within the lever engage the teeth shown on the inner edge of the segment, thus locking the lever in the low position until at a touch from the driver it returns upward toward the steering wheel into the high gear position. The fulcrum ratios of the mechanism are such that little muscular effort is required and the hand is always free for purposes of steering.

The pedals act with the levers at all times. Hence, at the option of the driver, the car may be operated with the feet alone, with the hands alone, or with both

together. A pawl key in each lever makes any combination possible in a moment.

Barco Muffler Cutout

The Barco Brass and Joint Co., Chicago, is marketing a cutout made of malleable iron which is clamped around the exhaust pipe and requires that the pipe have a V-shaped cut made in it. The bottom of the valve is solid and the seat is beveled. The prices range from \$2.25 for the 1-inch to \$4.50 for the 3½-inch, all bored to exact size.

Ward-Leonard Rheostat

A new rheostat which can take care of from one to four battery cells at a charging rate of 8 amperes has been brought out by the Ward-Leonard Electric Co., Bronxville, N. Y. The rheostat is inexpensive and is only 11 inches square by 3½ inches deep. The rheostat is shown in Fig. 6.

Fouts-Hartz Non-Backfire Valve

In order to prevent a fire and protect the carburetor from backfires, the Fouts-Hartz Valve Co., Wyoming, Ill., has brought out a valve which is placed between the carburetor and intake header. This valve consists of two lips as shown in Fig. 8, operating on a hinge. When the motor is running the mixture keeps the lips open, but as soon as the suction ceases the lips drop backward, close the passage and thus any backfire will not go beyond the lips. Dripping of gasoline from condensation is prevented also, it is claimed. When a backfire takes place the expanding gas is permitted to pass out through a relief valve inserted in the intake manifold as shown and in this way the carburetor is protected.



FIG. 2—WALSTAD CONTROL SYSTEM

With this device it is possible to drive a car without the use of the feet, all the gear-changing and clutch work being done with the hands

spark plug, which is claimed to have an unbreakable porcelain insulator, is announced by the Randall-Miller Co., Boston, Mass. The porcelain of this plug has a taper seat wound with asbestos and is pressed into a steel shell. The absence of gaskets and nuts for securing the porcelain is an added feature and the entire construction such that the plug does not leak, it is claimed. A ridge at the lower edge of the porcelain protects the asbestos packing and also allows the parts to expand and contract with temperature changes. The R. M. plug, shown in Fig. 1, sells for \$1 or in half-dozen sets for \$5.

Dihedral License Pad

An unusual license pad for motor cars has just been brought out by Louis Gott-

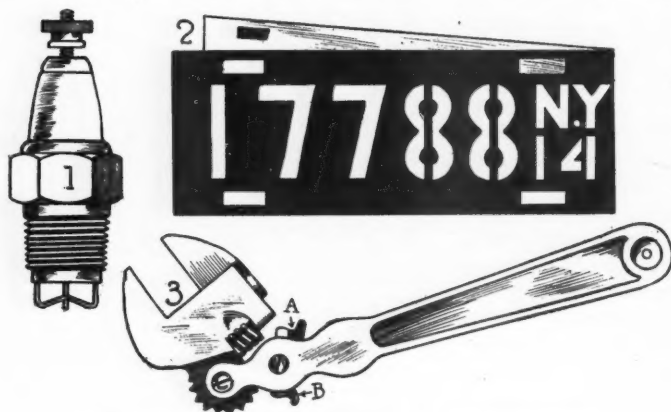


FIG. 1—THREE NEW ACCESSORIES OF THE WEEK

1—R. M. spark plug which has the porcelain pressed into the steel shell; 2—Dihedral license pad, which consists of two sheets of metal, one with numbers and the other acting as a reflector. The light from the tail lamp is directed between the two sheets; 3—Universal wrench, the jaws of which can be moved through an angle of 120 degrees

R. M. Spark Plug

A new type of

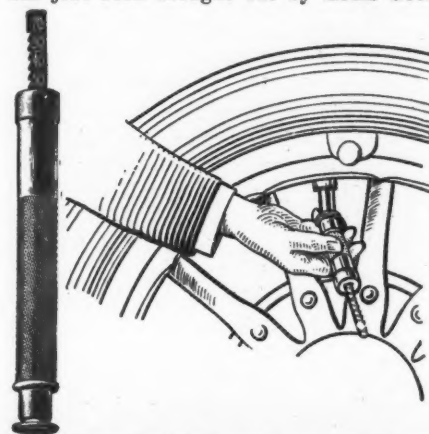


Fig. 3—New Twitchell pencil gauge which may be held at any angle

schall, New York, this device consisting of two metal sheets hinged together at one end. The number pad has the figures cut out of the metal and the other sheet which is behind the one with the number, acts as a reflector for the light from the tail lamp. As shown in Fig. 1 the two sheets may be spread apart and when in this position they are used at night by permitting the light from the tail lamp to enter between them. This light is reflected by the rear sheet and the license is clearly visible for a great distance, it is claimed. It is stated, also, the light appears the same from any angle. For use during the day the rear sheet is swung forward so as to come in contact with the numeral sheet and when so positioned the plate appears like one with embossed figures.

New Twitchell Gauge

An improved Twitchell pressure gauge for tires is announced by the Twitchell Gauge Co., Chicago. This gauge in general appearance is the same as that marketed previously, but slight improvements have been made in its construction. The feature of the Twitchell is that it may be held at any angle and therefore can fit a wheel of small diameter, as shown in Fig. 3. The lock-stop feature is retained. It sells for \$1.

Universal Wrench

The Universal Wrench and Tool Co., Sterling, Ill., announces an adjustable wrench which is said to take the place of an entire set of ordinary wrenches, be-

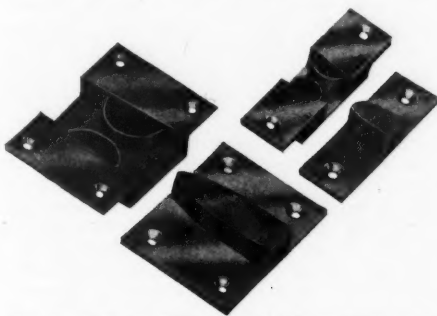


Fig. 4—O'Brien bumpers which prevent doors from rattling

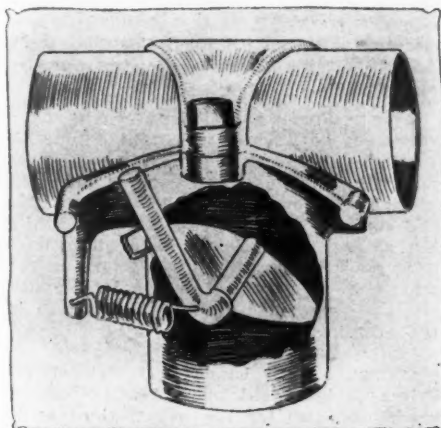


Fig. 5—A muffler cutout called the Stryker which is supported on the exhaust pipe at three points

cause the jaws can be moved through an arc of about 120 degrees, and set at any desired point within the limits. The jaws of the Universal are pivoted to the handle and can be locked from movement in either direction by pressure on the ratchets A and B in Fig. 1. The jaws can be opened up to $\frac{5}{8}$ inch. This wrench sells for \$1.50.

Thermo Cutout Fuse

R. H. Maple, Indianapolis, Ind., has recently brought out a fuse which breaks an electric circuit by the expansion of special metal, which actuates a simple switch instead of by melting an easily fusible alloy, which is used ordinarily. The advantage of this device is that once the circuit is broken it may be completed again by merely pushing up on the button that extends through the front casing, instead of being required to put in a new fuse.

The cutout shown in Fig. 7 is for a one-wire system, and where two wires are used two cutouts are combined in the same container. With the former system the wire may be connected either to the right or left outside terminal, and the ground wire to the other outside one. From the left terminal the current passes out through the contact points A to the center terminal, where the current is led to the right terminal through the wire B and the coil of metal. The contact points A are held together by means of the cam-like projection on the arm D, and this arm is held in place by the coil.

When current passes through the circuit that might injure the windings of the motor or generator, for example, the sensitive metal in the thermostatic coil is heated and expands and this causes the end of the coil to move to the right to allow the arm D to drop out of position and the contact points A to separate. It takes from one-half to 10 seconds for this to occur. After the difficulty that caused the excessive current to flow has been remedied, the fuse can be put in operation by raising the arm by means of the button that extends through the front of the case.

Anti-Rattling Door Bumpers

To prevent the rattling of the doors of the car, and at the same time eliminate the noise and shock that ordinarily occurs when a door is closed harshly, the Joseph F. O'Brien Mfg. Co., New York, has brought out the device shown in Fig. 4. It consists of a metal tongue, fastened to the door, which slides between two rubber segments in the other member which is attached to the body frame. The spreading apart of these rubber segments, cushions the closing of the door and holds it against rattling. The rubber jaws are protected against wear by bands of spring steel. The device is made in two sizes and sells for 75 cents and \$1.

Stryker Muffler Cutout

An improved form of muffler cutout has been put on the market by C. W. Stryker, Syracuse, N. Y. The feature of the new device consists in supporting it on the ex-

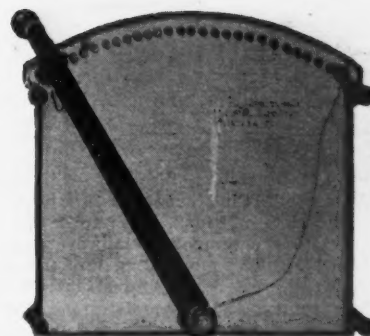


Fig. 6—Ward-Leonard rheostat which can take care of from 1 to 4 battery cells

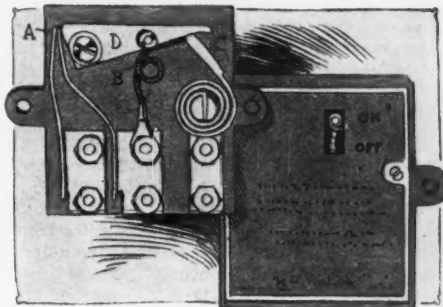


Fig. 7—A cutout fuse for electric lighting systems which breaks the circuit at the proper time, due to the expansion of a special metal

haust pipe at three points. It will be seen in Fig. 5 that the cutout is clamped over a hole that is cut in the exhaust pipe, and that it bears at three points, two being on the bottom and one on the top. It is stated that this feature eliminates any tendency to leakage around the joints of the cutout due to the unevenness of the pipe. A simple damper valve is used and all the working parts are on the outside.

Radiatol Radiator Compound

A compound which is said to prevent the formation of scale in the radiator of a car is announced by the Wills Chemical Co., Wheeling, W. Va. The substance sells for \$1 and appears to be used in solution with the water already in the radiator.

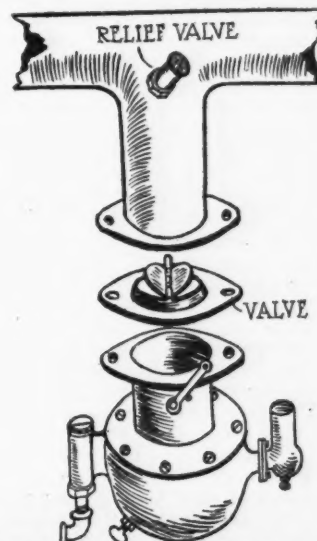


Fig. 8—Fouts-Hartz valve which is said to prevent injury to motor parts, due to backfiring



From the Four Winds



RIPON Motorists Organize Club—The Ripon Automobile Club has been organized by sixty motorists of Ripon, Wis., to devote its attention to the temporary improvement of the principal highways leading into the city. L. W. Thayer was elected president; F. W. Kohl, secretary, and James L. Stone, treasurer. The officers constitute the executive committee.

Pennsylvania License Records Broken—All records for motor car licenses issued in the state of Pennsylvania were smashed this week when the number reached 100,000. Last year only 131,204 licenses of all kinds were issued. This year, with 5 months passed, more than 137,000 have been issued. The total amount of money received is \$982,323 as compared with \$841,000 last year.

Country Club House Opened—The country house of the Automobile Club of St. Paul was opened Memorial day. It is at White Bear lake and Goose lake, a few miles from the city. The day was made a festal occasion, with band concerts, dinner and dancing. B. G. Kill, former manager of the Hotel Radisson in Minneapolis, is in charge of the club. Governor A. O. Sherart and other state, city and motor club officials were present from the twin cities and state. The campaign to raise the membership from 500 to 1,200 closed with the house opening and the admission fee was restored.

Gas Explosions Injure Motorists—One person is dead in the Cushing oil fields in northern Oklahoma and six seriously burned as the result of explosions of gas along the roads of the field from burning motor car lamps. In both instances, the members of the motoring parties failed to extinguish their lamps before they reached the danger zones. The machines were enveloped in flames and the death of all members of both parties was narrowly averted. So heavy have been the fumes of the escaping gas recently that all persons passing through the fields have taken the precaution of extinguishing their lights and danger zones have been marked.

New Los Angeles Traffic Rules—Starting June 1 Los Angeles motorists had to observe the following new code of laws: Keep to the right; signal before turning in street; keep with the traffic; stop car within at least 2 feet of curb; stop 10 feet in rear of street car until passengers have alighted or boarded; keep 5 feet away from street car when passing standing street car in business district; serve a jail sentence if convicted twice within a year on intoxication charge; do not use muffler cut-outs; slow down to 12 miles passing school houses; do not use colored lights; do not park cars in front of theatres.

Must Pay Back Licenses—Iowa motor car owners who have failed to pay state license fees in other years must pay the back taxes even if their cars were owned by other persons prior to this year. Such is the ruling of the state motor car department under the supervision of W. S. Allen, secretary of state. Litigation is sure to result as many owners threaten to bring test cases. It has been found that in many cases where fees are tendered for 1914 number plates there was no fee paid in 1913, and in some cases in 1912, yet the record may show that the cars were in service during those years. This means that the local authorities in Iowa have in some cases permitted the

operation of cars during a period of at least 1 whole year without registration. New numbers are being refused until back taxes are paid. In cases where cars now are in the hands of third persons under purchase, present owners are objecting strenuously and threatening to begin suit to test the right of state officials to require payment of the back fees. The state is standing pat.

Canada Imports Over 7,000 Cars—During the past 12 months, Canada has imported more than 7,000 motor cars from the United States, the total value of which was slightly over \$9,000,000. Five years previous Canada bought only 385 cars from United States makers and their value came to \$700,000. In 1913, which was far from one of the brightest commercial years, the records show an importation of 934 cars over the number for 1912. The absence of the English-made car on the Canadian market continues to excite the wonder of foreign visitors. Under the

preferential tariff, cars from the old country enjoy a reduction of duty from 22½ to 35 per cent, ad valorem. The importations, however, are almost negligible—somewhat like 2 per cent—in comparison with the annual sales of domestic and United States makes.

Goods Roads Day in Washington—Residents of the state of Washington celebrated good roads day May 22 when thousands of farmers and business men turned out to drive split-log drags over the highways of the commonwealth. Governor Ernest Lister was in command of the good roads army and rode across the state in a motor car on a speech-making trip in the interest of highway improvement.

Students Build Fireproof Garage—A model fireproof garage is being constructed by students of the LaCrosse county agricultural school at La Crosse, Wis., as a part of the course in practical construction work. The building will be equipped for private garage and repair shop purposes and have room for a gymnasium. The structure will be practically a monolithic mass and all the work will be done by the students under the direction of a competent instructor.

Registrations Pass 40,000 Mark—Forty-two thousand private-owned motor cars, the largest number ever existing in Wisconsin, are now registered in the office of the secretary of state of Wisconsin. On May 25 the total 1914 registration passed the 40,000 mark and on May 30 the number had been increased by 2,000. The 1913 registration was 34,646 and there is now no doubt that the 1914 registration will exceed that of last year by at least 10,000 before the end of the year. The average value of these cars is \$1,200, according to figures compiled by the secretary of state. In addition to the 42,000 private car registrations, there are 1,132 dealers licensed in Wisconsin.

Road Essay Wins Writer Trip—In a contest in which nearly 5,000 children from all over the United States engaged, two girls and a boy, all aged 14, have been awarded prizes by Logan Waller Page, director of the U. S. office of public roads, for writing the best essays on the repair and maintenance of dirt roads. So admirable was the essay submitted by Amy Coon, of Scammon, Kas., and so well did she lay down the fundamental rules to be observed even by road engineers that the American Highway Association, in addition to the medal awarded by Mr. Page, has decided to send her to the American Road Congress to be held in Atlanta early in November, paying all expenses.

Drag to Follow the Flag—Iowa will hold a statewide good roads celebration June 15. Sunday, June 14, is Flag day, and the drag will follow the flag. Governor Clarke has proclaimed Monday, June 15, as drag day and good roads day. Des Moines will hold a big general celebration which will attract good roads boosters from all sections of the state. A drag contest will open the day and a big gymkana event will be staged in the afternoon. Perry, Iowa City, Grinnell, Atlantic, Guthrie Center and Gowrie are planning to send bands and delegations. Prizes will be offered for the best and largest bands and also for the twenty-third bald-headed man and the twenty-third red-headed girl to enter the gates of the state fair grounds, where the show will be staged. Oskaloosa is prominent among outside cities

Coming Motor Events

SHOWS AND CONVENTIONS

June 23-26—S. A. E. summer meeting, Cape May, N. J.
September 26-October 6—Berlin show.
October 17-24—Show, Pittsburgh, Pa.
October 18-26—Paris show.
November 6—Olympia show.
November 9-14—American Road Congress, Atlanta, Ga.

CONTESTS

June 10-11—Isle of Man road races, Great Britain.
June 18—Hill climb, Uniontown, Pa.
June 20—Interclub reliability, Philadelphia, Pa.
June 27-July 4—National touring week.
June 30—Track meet, Sioux City, Ia.
July 4—French grand prix, Lyons.
July 3-4—Montamara Feste road races, Tacoma, Wash.
July 4—Three hundred mile race, Sioux City, Ia., speedway.
July 4—Track meet, Providence, R. I.
July 4—Hill climb, Richfield Springs, N. Y.
July 4—Road race, Prescott, Ariz.
July 17-18—Speedway races, Seattle, Wash.
July 18-19—Speedway races, Seattle, Wash.
August 1 and 3—Beach meet, Galveston, Texas.
July 25-26—Belgium grand prix road races.
August 16—Le Mans cyclecar grand prix race.
July and August—French army truck subsidiary trials.
August 2-9—Six day cyclecar reliability in French Alps.
August 16—Coupe Internationale; light car race, Le Mans.
August 17—Grand Prix of France, Le Mans.
August 21-22—Road races, Elgin, Ill.
September 5—Track meet, Milwaukee, Wis.
September 6-7—Italian grand prix.
September 7—Track meet, Providence, R. I.
September 9—Speedway races, Pomona, Cal.
September 9—Road race, Corona Beach, Cal.
September 14—Track meet, Milwaukee, Wis.
September 18-19—Track meet, Hutchinson, Kans.
October—Gallion hill climb, Paris.
October 2-3—Track meet, Oklahoma City, Okla.
October 2-3—Track meet, Trenton, N. J.
October 9—Speedway race, Chicago.
November 8-11—Track meet, Shreveport, La.
November 15—Kerosene motor tests, Paris, France.
November—El Paso-Phoenix road race.

* Sanctioned by A. A. A.

that will stage shows of their own. Many smaller towns are making preparations for good road work and booster meetings. Governor Clarke is to address the Des Moines celebration.

Car Thieves Busy in Dallas—Steps to stop the wholesale stealing of motor cars now going on in Dallas, Tex., have been taken by the Dallas Automobile Club which discussed the matter at its last regular weekly meeting. The club has inaugurated an innovation in the form of a question box, in which questions dealing with problems of owner and drivers are placed and then discussed at open meeting.

Tacoma Race Officials Named—The following officials have been selected for the Tacoma races: Judges, Joseph Blethen of Seattle, Al. B. Howe of Tacoma and W. J. Patterson, Aberdeen; referee, F. Garrett Fisher, Tacoma; starter, M. A. Howe, Tacoma; assistant starter, F. E. Jeffries, Tacoma; timer, R. H. Pendleton, Venice, Cal.; assistant timer, M. L. Davis, Tacoma; chairman technical committee, A. F. Lausen, Jr., Tacoma.

Use Studebaker as Switch Engine—A Studebaker six was recently impressed into use in San Francisco as a locomotive in the Santa Fe yards. The local agents desired three carloads of motor cars moved from the yards to the unloading station, but all the switch engines of the railway company were in use, so the motor car was coupled to the freight cars and pulled the load totaling 62 tons to the required place without trouble.

Studebaker Wins Sociability Run—P. Leonard, driving a Studebaker car, won the first prize in the Tacoma "Ledger's" sociability run to Mount Tacoma Memorial day, making the course from Tacoma to the Canyada hotel on the mountain, a distance of 70 miles, in 3 hours, 54 minutes. B. H. Kennedy took the second trophy with a Cadillac. His time was 3 hours 58 minutes. Mrs. C. L. Hoska made the best time among the women drivers.

"Seedling" Miles on Lincoln Highway—Thomas H. McDonald, of Ames, Ia., state highway engineer, announces plans for "seedling" miles to be planted along the path of the Lincoln highway in Iowa this year. Mr. McDonald has conferred at Clinton with Vice-President Pardington of the Lincoln Highway Association. The Iowa plans are for thirteen "seedling" miles or one for each county which the highway crosses in Iowa. The idea is for each county to add to the mile built by the association. It is hoped that the "seedling" miles thus will germinate into many other miles and eventually become a continuous stretch of permanent road across Iowa. Mr. McDonald will be in charge of the plans and construction work.

To Test New Paving Material—Milwaukee is going to experiment with a new type of pavement generally adopted in Iola, Kan., and other cities, to improve the many miles of macadam streets which are eating up large funds each year for maintenance. The Iola pavement consists of about 85 per cent mud and 15 per cent asphalt and is laid on macadam to a depth of $3\frac{1}{4}$ inches. The mixture is made with a patented machine. The resultant surface is dustless, and experience at Iola shows that it has stood two hard winters without showing signs of wear or destruction. About ten blocks will be covered with the mixture this summer as an experiment, and if it is successful in the Milwaukee climate it is planned to improve several miles of macadam streets next year.

Thirty Cars for Reliability Run—Thirty cars will participate in the second annual reliability tour between the Milwaukee Automobile Club and Milwaukee Athletic Club on Saturday, June 20. Fort Atkinson, Wis., the



SAN FRANCISCO bound and pulling an advertising wagon behind them, Lloyd Lee and Don Wilkes left Davenport, Ia., the morning of June 1 for a strenuous hike to the Pacific coast. They will follow the River-to-River road to Des Moines, then go to Kansas City by way of the Interstate trail and travel the remainder of the way on the National Old trail. They expect to reach their destination January 1, 1915. Lee and Wilkes are making the trip under the auspices of the Iowa State Automobile Association and in the interest of good roads. They will give good roads talks and form motoring and good roads clubs in each of the towns on their itinerary.

scene of an important battle in the Blackhawk Indian war, will be the noon control and the clubs will be the guests of the City Club during their stay. The distance will be about 135 miles and will be made in 1 day. The winning club will be awarded the Wisconsin Motorist trophy, won last year by the motor clubmen.

Testers to Play Sleuth Roles—The Indiana Automobile Manufacturers' Association is preparing to undertake a statewide campaign against the theft of motor cars and the recovery of cars that have been stolen. Each manufacturer identified with the association will be asked to have the drivers of its test cars be on the lookout for stolen cars. Indianapolis manufacturers for some time have had drivers of their test cars watch for stolen cars and a number have been recovered in this manner.

Places Ban on the Motor Car—The motor car was placed under the ban last week by the German Baptist church at a national convention held on a farm near Frankfort, Ind. Only three delegates voted in favor of the use of the gasoline-propelled vehicle while more than 300 turned down their thumbs on it. The resolution passed advised "all churches not to allow their members to own or operate motor cars, motor trucks, motorcycles or any motor vehicles at least until such time as they become in general use or until we get more light on the subject." What do the German Baptists mean—"general use"?

To Discuss Uniform License Tag—Owing to the variety of shapes and sizes of license tag prescribed by the laws of the various states, as well as conflicts as to the manner in which tags shall be displayed, motor car manufacturers thus far have been unable to arrive at an entirely satisfactory method of mounting the tag, while purchasers of new cars often find it difficult to label them in a perfectly lawful manner. In many cases the result is that the tags are applied in such a way that the numbers are partially obscured from certain points of view, while in others several adjustments have to be made before the requirements of the police are entirely satisfied. With a view to

obviating these difficulties the Society of Automobile Engineers at its summer meeting at Cape May, June 23-27 will consider the advisability of recommending a uniform style of tag, which could be mounted in a uniform manner, and which would not only satisfy every reasonable demand, but also be a source of no trouble to the owner.

Concrete Road from South Bend—The Lincoln Highway Association of St. Joseph county, Ind., carried by a large majority, the road election held by the county commissioners May 28. This assures a center strip of concrete 18 feet wide backed up with 6 feet of gravel on each side across St. Joseph county which will be laid this year. This will close up one of the worst pieces of road in the state of Indiana, between South Bend and New Carlisle, with which all the motorists are familiar.

Wisconsin to Have Ford Day—E. C. Schumann, of Milwaukee, a private Ford owner, has originated the idea of a Wisconsin-Ford day, and on Saturday, June 20, expects to gather about 33 1/3 per cent of the Ford owners in Wisconsin at Milwaukee for a general frolic, based on the fact that each participant is the owner of a Ford car. From the last report of the secretary of state it is found that there are at present 11,000 Fords in Wisconsin, and Mr. Schumann will get in touch with each one. The program has not been completed, but contemplates a basket picnic on Lake Michigan near Milwaukee. There will be a list of gymkana stunts for prizes.

Would Honor First Car Builder—John S. Donald, secretary of state of Wisconsin, and interested in motor cars by reason of being the administrative officer of the law requiring the registration of motor cars, has started a movement to publicly honor Dr. J. W. Carhart, a Presbyterian minister who resided at Racine, Wis., for many years, and who built and operated the first motor-propelled vehicle in America as far back as 1876. Dr. Carhart is now a resident of San Antonio, Tex. It is planned to ask the legislature to appropriate funds for a medal and a purse of several thousand dollars in recognition of Dr. Carhart's contribution to humanity.



Among the Makers and Dealers



BUYS Interest in Truck Company—Howard Wilcox has acquired an interest in the Signal Motor Truck Co. of Detroit and will act as consulting engineer and sales manager.

Gardham Hudson Factory Inspector—Joseph Gardham, who has been with the Hudson Motor Co., of Detroit, for some time in various capacities, has been appointed its chief factory inspector.

Enlarge Plant to Build Small Car—The Kearns Motor Truck Co. of Beavertown, Pa., has acquired 25,000 additional square feet of floor space which will be devoted to the building of a small car which has been christened the Lulu.

Tom Jones With Empire Company—Tom O. Jones, advertising manager of the Marion Motor Car Co., Indianapolis, has resigned and accepted the appointment of advertising and export manager for the Empire Automobile Co., Indianapolis, following the resignation of Harlow Hyde.

Rice Returns to Atwater Kent—After more than a year's absence, during part of which he was actively engaged in marketing a new accessory, and the balance in studying western sales conditions, H. E. Rice has resumed his duties with the Atwater Kent Mfg. Co., of which he is now manager of sales and advertising.

Invents Substitute for Brass—J. A. Fletcher of Chicago, inventor of a new metal alloy adapted particularly for use in motor car and engine parts, is negotiating with local capital with a view to establishing a plant in Green Bay, Wis. The material is a substitute for brass and has economy and greater strength to recommend it over brass and bronze alloys, it is claimed.

Manufacturing New Gas Gauge—Walter Oeschger, LaCrosse, Wis., and his father, John C. Oeschger, have concluded negotiations with a syndicate at Detroit, Mich., for the manufacture of gauges for gasoline tanks, dash indicators and other containers embodying the use of a new chemical discovered by the LaCrosse boy. By the use of this chemical, variations of $\frac{1}{16}$ of an inch in the level of a fluid in a tank are accurately gauged. Young Oeschger is a senior

in LaCrosse high school and only 18 years old. The new corporation has closed contracts with several large Detroit companies for the use of the Oeschger gauge on their 1915 cars.

Ship 30 to 35 Cars Daily—The Mitchell-Lewis Motor Co., Racine, Wis., is now shipping from thirty to thirty-five cars daily and intends to keep up this production until July 1 when the 1915 model will be brought out.

College Professor With Tire Company—Professor Walter Parke Bradley, for 25 years professor of chemistry at Wesleyan University in Middletown, Conn., has resigned to enter the service of the United States Tire Co.

Arnold Leaves Houk Company—E. E. Arnold has resigned as chief engineer and sales manager of the Houk Mfg. Co., Buffalo, N. Y., in order to devote his entire time to the management of the Standard Screw Products Co., Detroit, Mich., in which he is interested. The Standard Screw Products Co. will immediately enlarge its plant for the development of one or two new specialties.

Overland Holds Annual Meeting—Ninety-five representatives of the Willys-Overland Automobile Co., assembled in Toledo from all over the world week before last at the annual convention held at the big plant on Central avenue. Every state in the union from Maine to California was represented and also such far-away countries as New Zealand, South Africa and China. The convention convened Tuesday morning and terminated Friday when the travelers were carried to the Indianapolis 500-mile race in a special car.

Gets Patent on New Tire—The Prenzel sectional pneumatic tire is the name of a recently patented tire, designed to reduce the cost of punctures and at the same time prevent the necessity of making puncture repairs while out on the road. Each tire is made up of fourteen separate air chambers and each section is provided with a tiny inner tube so that should the wheel strike a nail or other sharp instrument, but one of the air chambers will be punctured. Application will be made to Governor John J. Tener

of Pennsylvania, for a charter June 18. The capital stock of the company is to be fixed at \$250,000. The incorporators are: A. H. Prenzel, Luther W. Ryan, L. Samuel Marshall and Frank B. Clayton.

Pilkington Made Resident Engineer—Robert J. Pilkington has been appointed resident engineer of the American Efficiency Survey of Motor Car Units and is now in charge of the organization's laboratories at LaFayette, Ind.

Engine Company to Build Factory—The Buckeye Machine Co., manufacturer of gas engines, owned by Edward Neiswander, C. P. Neiswander, J. A. Neiswander, will locate a new factory in South Lima, O. The site consists of 3 acres lying between Atlantic avenue and Broadway, south of the C. and E. tracks. The main building will be of brick.

To Enlarge Firestone Plant—The Firestone Tire and Rubber Co. contemplates the erection of a large addition to its plant, following the custom which was started in 1910. One of the present wings of the factory which is 60 feet wide and five stories high will be extended a distance of 125 feet. Other wings will also be extended giving 95,000 additional square feet of floor space. Another contemplated is the installation of a new 4,000 kilowatt generator.

New Spring Company Formed—A company has just been formed at Mount Clemens, Mich., for the manufacture of motor car springs, the title of the new corporation being the Pullau Steel Spring Co. A. J. Pullau, after whom the company is named, has been for 10 years connected with the production end of the Detroit Steel Products Co. The company is capitalized for \$75,000. Work has been started on a one-story plant, 175 by 74 feet. The officers of the new company are: A. T. Donaldson, president; A. J. Pullau, vice-president; Clifton D. Jackson, secretary-treasurer.

Empire Trans-Continental Car Returns—With a record of 19,000 miles to its credit, Empire car No. 19, which had the distinction of being the smallest car to participate in the Indiana-Pacific tour last summer, last week returned to Indianapolis. The Empire is one of the few cars participating in the trans-continental tour to return to Indianapolis under its own power. After driver Joe Moore had taken the machine across the country it was placed at the disposal of Pacific coast distributors as the show car and was constantly on the go, adding thousands California, Washington and Oregon miles to its record before starting the return trip.

Ford Victor in Unique Suit—The supreme court of the state of Michigan has rendered a decision in favor of the Ford Motor Co., of Detroit, against Jan Janik, who claimed to have been injured by a motor car belonging to the company. The whole question was a matter of deciding the ownership of the car which struck Janik. According to the evidence John I. Werner, agent of the Ford company in Bronson, Mich., came to Detroit with a prospective buyer named Klein, and purchased a car at the Jefferson salesrooms of the Ford concern, paid for it and got a driver to take him to the city limits. It was while on the way that Janik was struck and as the car had a Ford's company's number he brought suit against the Ford company. The case came up in the Wayne county court and it was claimed by the Ford company that the owner of the car was Werner, who had paid for it, and that the driver was serving Werner and not



WHEN the residents of St. Louis ex themselves from unexpected guests and look hopefully in the family ice box to find it empty, they do not rush down to the corner delicatessen store for ham and cheese and potato salad and dill pickles. They return to the parlor and calmly wait until the delicatessen store comes to them. For St. Louis has a traveling delicatessen store. It is a 7,000-pound Gramm truck equipped with a rather unusual body. William Goldstein is the proprietor of this first-aid-to-the-perplexed-housewife vehicle and says as a money maker, it has a stable corner site beat several city blocks.

the Ford company. The lower court had already sustained the views of the Ford company and now the supreme court also has decided in its favor.

Marketing New Hub Odometer—The American Taximeter Co., New York, has taken over the sales for the United States of the Transimeter, a new hub odometer, in connection with the distribution of its taximeters and recordographs.

European Branch for Willard—R. C. Norberg, assistant general manager of the Willard Storage Battery Co., Cleveland, has sailed for Europe where he will arrange for the installation of a main branch of the Willard company and establish service stations in the larger European cities.

Jeffery Daily Output 35 Cars—Thirty-five cars per day, or a total of more than 900 for the month, was the record of the Jeffery factory during the 25 working days of May. New men are being added to the Jeffery force daily, although the working time is now 13 hours, and the schedule for June is 1,200 cars.

W. T. Bull Dies at Racine—Wakley Truman Bull, who assisted his brother-in-law, Jerome I. Case, and brother, Stephen Bull, in the foundation of the J. I. Case T. M. Co., Racine, Wis., died at Racine last week, aged 80 years. His brothers Stephen and Charles Bull died within 2 weeks of each other early this year.

Mack to Build Los Angeles Branch—J. A. Stoner and W. M. Thompson of the Mack Truck Co. have decided to build a factory branch in Los Angeles, which will be completed within the next 3 months. The plant will employ 300 workmen and will supply trucks for the territory west of the Rocky Mountains and also British Columbia, Hawaii and the Orient.

Tire Factory for San Antonio—The Luck Tire and Mfg. Co. is preparing to erect its plant at San Antonio for the manufacture of a tire especially suited to the Texas and southwestern climate. A free site will be donated by the San Antonio Chamber of Commerce for the factory. J. J. Luck, the inventor of the tire, is interested together with several San Antonio people.

Cyclecar Dealers Organize—The cyclecar dealers of Philadelphia have formed the Cyclecar Association of Philadelphia and elected the following officers: President, Fred R. Elston; vice-president, Leland S. Hannold, and secretary-treasurer, Samuel G. Flamm. Besides pushing cyclecar sales, the association aims to promote races and reliability runs during the coming summer and hold an indoor show during the winter. The organization will seek affiliation with Cyclecar Manufacturers' National Association.

Board Is Re-elected President—R. V. Board was continued as president of the Kentucky Wagon Mfg. Co. by the directors at a recent meeting, and the position of chairman of the board of directors, which had been held by W. C. Nones, former president, who recently opposed the re-election of Mr. Board, was left vacant. Other officers elected are: Philip S. Tuley, vice-president; W. P. Gruesling, treasurer and district sales manager; J. I. Shelley, secretary and district sales manager, and W. J. Coleburn, factory manager.

Cole Loses Texas Suit—An important decision affecting motor car sales agencies in Texas has been handed down in the federal court at Dallas by Judge Meek in the case of the Cole Motor Car Co. of Indianapolis versus Charles F. Hurst and others. Hurst has the agency for cars manufactured by the Cole company, which attempted to restrict his territory. The court held that such restriction was in violation of the Texas anti-trust law. Hurst and his guarantor were sued by the company to recover

Recent Incorporations

Albany, N. Y.—Stokes Carburetor Co., capital stock, \$100,000; incorporators, T. M. Stokes, W. M. Stokes, J. F. Smith.

Albany, N. Y.—Eastern Parts Mfg. Co., capital stock, \$6,000; to manufacture motor vehicles; incorporators, J. Greenthal, G. C. Young, B. Frankel.

Bellefonte, Tex.—Buckingham Ram Washington Motor Co., capital stock, \$7,500; incorporators, C. F. Bellmuth, M. Bader, F. C. Roensch.

Binghamton, N. Y.—Canfield Gas Engine Co., capital stock, \$50,000; incorporators, W. J. Newing, A. L. Newing, E. L. Whitlock.

Birmingham, Ala.—Union Automobile Supply Co., capital stock, \$10,000; incorporators, S. W. Wexler, W. B. Stokes.

Boston, Mass.—Cadillac Automobile Co., capital stock, \$100,000; to deal in motor cars; incorporators, A. L. Danforth, B. Danforth, J. McGregory.

Brooklyn, N. Y.—St. Mark's Garage, capital stock, \$10,000; incorporators, D. Saladino, A. Quick, A. M. Quick.

Cincinnati, O.—Main Auto Machine Co., capital stock, \$5,000; motor car repair shop; incorporators, G. D. Haynes, J. N. Weber, N. Weber, W. Rieker, G. J. Fredricks, Jr.

Cincinnati, O.—Archibale Brouse-Parker Co., capital stock, \$5,000; to repair motor cars; incorporators, H. M. Brouse, W. H. Parker, R. J. Archibale, W. R. Parker, G. J. Fredricks, Jr.

Cincinnati, O.—Automobile Livery Co., capital stock, \$1,000; to operate taxicab business; incorporators, W. C. Jungelas, J. C. Johannigman, J. A. Duchemin, A. Helzmann, G. Fennerman.

Cleveland, O.—Hudson Motor Sales Co., capital stock, \$25,000; to deal in motor cars and accessories; incorporators, C. W. Comstock, L. A. Krus, J. C. Rovon, M. T. Gorton, F. M. Wolke.

Cleveland, O.—Telescop Fender Co., capital stock, \$50,000; to make accessories; incorporators, C. L. Weissel, A. Sharp, R. E. Dickson, H. M. Dolan, E. D. Sabin.

Cleveland, O.—Alday Mfg. Co., capital stock, \$10,000; to manufacture motors; incorporators, H. A. Hauxhurst, M. T. Flanagan, F. X. Cull, R. Ingils, V. Svanear.

Columbus, O.—Dunlap Electric Truck Co., capital stock, \$20,000; to manufacture and deal in electric vehicles; incorporators, T. C. Dunlap, G. R. Hedges, S. A. Hoover, H. R. Tingley, M. E. Heasley.

Danbury, Conn.—Ball & Roller Bearing Co., capital stock, \$100,000; incorporators, L. H. Heim, J. H. Roth, W. C. Barrett.

certain sums alleged to be due the company for the sale of cars. The verdict was given for the defendant.

New Sales Manager for Wagenhals—Alfred J. Pitts, a former Detroit newspaper man, has been appointed general sales manager of the Wagenhals Motor Car Co.

Lights Turn With Front Wheels—David Hughes of Racine, Wis., has engaged in the manufacture of an appliance by means of which motor car headlights are focused in the same direction as the front wheels. The device is being given a thorough tryout on all Racine fire department vehicles. Patents have been applied for.

Pullman to Build for LaVigne—The Pullman Motor Car Co. has under consideration plans for a big expansion of operations at its factory in York Pa., and besides engaging in the manufacture of its own product will build a large number of cars for the LaVigne Motor Co., of Detroit, Mich. Representatives of the latter company and a committee of creditors of the Pullman company, who were appointed recently to supervise the work at the York factory, will shortly decide on a definite contract and the work of building the cars will begin.

Dodge Bros. Name District Managers—The following appointments have been made by Dodge Bros., of Detroit, as district representatives: A. E. Barker, formerly with the Dean Electric Co., the Hoxe Electric Telephone Co., and the Universal Motor Truck Co., with headquarters in Cleveland; J. S. Collins, formerly with the Buick Motor Co., in Buffalo and in Saginaw, Mich., with headquarters in Detroit; J. H. Gordon, formerly with the Westinghouse Electric and Mfg. Co., and with the Detroit branch of the King

Dayton, O.—Dayton Overland Sales Co., capital stock, \$30,000; to deal in motor cars and supplies; incorporators, C. H. Bosler, R. Rouch, H. S. Allen, Charles Breene, G. Cross.

Hartford, Conn.—Greenleaf Mfg. Co., capital stock, \$35,000; incorporators, W. H. Greenleaf, G. J. Long, J. R. Hayes.

Indianapolis, Ind.—Comet Cyclecar Co., capital stock, \$30,000; incorporators, F. P. Merz, L. F. Merz, W. H. Ogborn.

Louisville, Ky.—Kentucky Auto Supplies Co., capital stock, \$2,500; incorporators, F. T. Hinkle, L. A. Henline, R. V. Nordeman, P. B. Collins.

Lowell, Mass.—Auto Rapid Transit Co., capital stock, \$10,000; incorporators, A. P. Best, E. R. Tryon, H. E. Best.

McAlester, Okla.—McAlester Car & Auto Works, capital stock, \$25,000; incorporators, H. H. Kirkpatrick, C. Coon, G. Desbier, G. LeBaron, G. C. Jones.

Muskogee, Okla.—W. R. Lantz Carriage & Automobile Works, capital stock, \$25,000; incorporators, W. R. Lantz, A. E. Lantz, J. O. Humphries.

Nowata, Okla.—Woods Garland Petroleum Co., capital stock, \$25,000; incorporators, A. T. Woods, E. G. Woods, A. Buchana.

Newark, N. J.—Boeraem-Nichols Motor Car Co., capital stock, \$100,000; incorporators, R. B. Boeraem, L. B. Theand, J. D. Nichols.

Newark, N. Y.—Remington Motor Co., capital stock, \$500,000; to manufacture motors; incorporators, P. E. Remington, C. W. Bliss, E. M. Kolstad.

New York—Stokes Carburetor Co., capital stock, \$100,000; incorporators, J. F. Smith, W. O. Stokes, T. M. Stokes.

New York—W. J. Donnelly & Co., capital stock, \$500; motor car accessories; incorporators, V. C. Bogardus, F. B. Dobbin, E. C. Hoberaft.

New York—Tubine Co., capital stock, \$10,000; to manufacture tire fillers; incorporators, O. S. Burr, A. Brile, F. Rosenbaum.

Oklahoma City, Okla.—Jennie Gasoline Extracting Co., capital stock, \$20,000; incorporators, J. H. Gauthier, G. W. Collier, J. A. Peterson, J. S. Thompson, H. Billingsley.

Orange, N. J.—Coppinger Motor Car Co., capital stock, \$5,000; incorporators, F. W. Coppinger, J. R. Monroe, H. G. Dechant.

Spokane, Wash.—Common Sense Auto-Lock Co., capital stock, \$1,000,000; incorporators, W. H. Purcell, R. B. Weber and others.

Toledo, O.—Boyd Tire & Supply Co., capital stock, \$10,000; incorporators, A. A. Atwood, D. P. Boyd, A. E. Boyd.

Toledo—Erie Sales Co., capital stock, \$5,000; incorporators, G. E. Beely, M. R. Smith, F. H. Lutz.

Tulsa, Okla.—Diamond Gasoline Co., capital stock, \$100,000; incorporators, J. W. Sanders, J. J. McPherson, W. H. McCrumb.

Utica, N. Y.—J. A. Cowley Auto Co., capital stock, \$1,000; incorporators, J. Owen, J. A. Cowley, J. A. Cowley, Jr.

York, Pa.—Chambersburg Auto Co., capital stock, \$40,000; to deal in motor cars; incorporators, D. G. Pfoutz, T. J. Brereton, F. M. Brereton.

Motor Car Co., with headquarters in Atlanta, Ga.; J. E. French, formerly with the Pennsylvania Rubber Co., with headquarters in San Francisco.

Reo Plant to be Enlarged—The plant of the Reo Motor Car Co., Lansing, Mich., will be enlarged soon. The new buildings are to represent an increase of about 30 per cent of the present capacity and are to be located on South Washington avenue. The concern plans to build 12,000 cars next year.

New Lee Tire Agencies Appointed—The Lee Tire and Rubber Co. of Conshohocken Pa., has appointed the following new distributors of its product: Lee Tire Sales Co., Milwaukee, Wis.; A. J. Reynolds, Tampa, Fla.; Aber-Schultz Auto Supply Co., Austin, Tex.; Auto Accessories and Speedometer Co., Denver, Colo.; Lee Tire and Supply Co., Grand Rapids, Mich.; Morgan Auto Co., Sioux City, Ia.; Galveston Motor Car Co., Galveston, Tex.; Northwestern Tire Co., St. Paul, Minn.; Goodby Rankin Co., Providence, R. I.; New York Auto Tire and Supply Co., Rochester, N. Y., and Bittel-Leftwich Tire Service Co., Springfield, Ill.

Buys Reliable-Dayton Assets—A. O. Dunk, president of the Puritan Machine Co., Detroit, Mich., has purchased all the assets of the Reliable Dayton Auto Co., of Chicago, from S. Winternitz & Co., auctioneers. This purchase includes all the patterns, tools, service parts and other property formerly owned by this concern. This entire stock has been moved to Detroit warehouses of the Puritan Machine Co. The Puritan Machine Co. is one of the largest buyers of defunct parts concerns in the country and is now supplying repair parts to over 65,000 private owners whose cars formerly were made by companies now out of business.



Brief Business Announcements



COLUMBUS, O.—C. T. Butin has been made assistant manager of the Motor Supply and Tire Co., of 128 East Gay street, Columbus.

Columbus, O.—Harvey W. Smith, who has been associated with the Curtin-Williams Automobile Co., of Columbus, for 8 years, has opened a repair and paint shop at 1982 North High street.

Indianapolis, Ind.—The I. J. Cooper Rubber Co., of Cincinnati, has opened an Indiana sales branch at 219 West Vermont street, Indianapolis. The company is distributor for Motz cushion tires and Racine tires and tubes.

Kenosha, Wis.—Announcement has been made by E. S. Jordan, general sales manager of the Thomas B. Jeffery Co., that A. H. Humphreys, formerly manager of the Newton-Humphreys Co., Newark, N. J., has been transferred to the management of the Stratton Auto Sales Co., New York.

Prairie du Chien, Wis.—The Keller and Harris Automobile Co., Prairie du Chien, Wis., has been reorganized, following the sale of the interest of Mr. Keller to Mr. Harris. It will henceforth be known as the Harris Automobile Co., with Mr. Harris as sole owner.

Appleton, Wis.—The Tire Repair Equipment Co., Appleton, Wis., which took over the business and plant of the Melli-Blumberg Co., New Holstein, Wis., some time ago, is now shipping garage vulcanizing equipment all over the world. Large consignments were shipped last week to Central America and Brazil. The company is building eight

models of tire repair equipment, from a small size for individuals to a large size for big garages.

Indianapolis, Ind.—J. E. Trotter, assistant manager of Chicago branch of Buick Motor Co., has been appointed manager of the Indianapolis branch, taking the place of Edward T. Strong, who becomes manager of the Chicago branch.

DePere, Wis.—J. J. Hallett, doing business as the DePere Motor Car Co., of DePere, Wis., has filed a voluntary petition in bankruptcy. Assets are scheduled at \$460.64 and liabilities at \$1,065.74. Exemptions of \$250 are claimed.

Columbus, O.—Under the management of W. R. Johnston, formerly factory manager for the Barndt-Johnston Co., a new concern for the manufacture of tops, bodies and other accessories, has been opened on Perry street, Columbus.

New York.—On account of the rapidly increasing business of the Dayton Rubber Mfg. Co., Dayton, O., manufacturer of Dayton airless pneumatic tires, the company has removed its office from 1874 Broadway, New York, to 1851 Broadway.

Los Angeles, Cal.—A permanent organization of garage and repair men has just been formed in Los Angeles. It is known as the Garage and Repair Men's Association and is organized for the protection of the public as well as the benefit of the members. Paul Wilcox, the leading spirit in the formation of this body, was elected secretary and treasurer. W. H. Jans is president and R. C.

McClay, vice-president. There are forty-two members in all and the card of membership will be displayed prominently in each garage.

Washington, D. C.—Sylvester & Livingston has opened a tire salesroom at 1623 Fourteenth street and will feature the Hood tire.

Cleveland, O.—The Mutual Motor Stores Co., Chicago, manufacturer of accessories, has secured a large space in the building at 1225-1227 Superior avenue, Cleveland, and will open for business as soon as the building can be placed in shape.

Omaha, Neb.—The Haynes Automobile Co. has appointed C. J. Corkhill district sales manager for the states of Nebraska, Missouri, Oklahoma, Kansas and Arkansas. Salesrooms have been established in Omaha and Kansas City, both of which are under the control of Mr. Corkhill.

Syracuse, N. Y.—The Brown Co., Syracuse, manufacturer of Impulse tire pumps and gauges, has bought that branch of the Automatic Machinery Co., of Cannistota, N. Y., formerly known as the Thomas Auxiliary Spring Co., manufacturing and selling Eclipse spring shock absorbers especially adapted for Ford cars.

Milwaukee, Wis.—The appointment of A. R. Cosgrove, of Detroit, as sales manager of its Vulcan electric gearshift department, is announced by the Cutler-Hammer Mfg. Co., of Milwaukee. Mr. Cosgrove for a number of years was sales manager of the National Drill and Mfg. Co., of New York, and for 6 years was the London manager for Strong and Trowbridge Co., of New York, which sent him around the world in its interests.

Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Ayden, N. C.	T. E. Cannon	Maxwell	Emerald, Wis.	George D. Love	Maxwell
Auburn, N. Y.	Moon Garage	Moon	Enterprise, Ore.	Enterprise Garage & Auto Co.	Maxwell
Altoona, Ia.	H. B. Blakely	Maxwell	Elba, Mich.	John S. Smith	Maxwell
Amthorn, Ia.	Amthorn Auto Association	Maxwell	Elmhurst, L. I.	J. H. Walsh	King
Amityville, L. I.	E. S. VanNostrand	King	Fraser, Colo.	W. E. Fenstermacher	Maxwell
Benton Harbor, Mich.	W. S. Robinson	King	Fayette, Mo.	Balaw & Kivett	King
Bridgehampton, L. I.	Leslie C. Hallock	King	Freeport, L. I.	Thos. Forbes, Jr.	King
Burlington, Vt.	Henry Todd	Maxwell	Fremont, O.	Hilt & Keating	King
Belleville, Ill.	Charles Procaskey	Maxwell	Fossil, Ore.	Fossil Mercantile Co.	Maxwell
Brown City, Mich.	C. J. Buck	Maxwell	Farnhamville, Ia.	Johnson Auto Co.	Maxwell
Belleplaine, Minn.	Joseph Neubeiser	Maxwell	Grand Junction, Ia.	W. W. Kirby	Maxwell
Berryville, Ark.	R. E. Morris	Maxwell	Grank Rapids, Mich.	L. Phelps, Mich. & Lafayette Ave.	King
Brownsville, Tenn.	F. H. Voltermann	Maxwell	Great Falls, Mont.	Johnson Motor Sales Co.	Maxwell
Bluefields, W. Va.	R. H. Henderson	Maxwell	Grand Forks, N. D.	Hanson Brothers Auto Co.	Maxwell
Boston, Mass.	J. M. Barry	Duryea	Georgetown, Ind.	C. W. Hess	Maxwell
Boston, Mass.	Reed-Atherton Co.	Vulcan	Greeley, Colo.	Greeley Garage	Maxwell
Bridgeport, Conn.	Emil L. Scherer	King	Gardner, Kan.	Dunn & Anderson	King
Brookfield, Mo.	A. C. Carpenter	King	Grand Saline, Tex.	H. P. Beart	Maxwell
Brooklyn, N. Y.	Cumberland Garage	King	Goodrich, N. D.	Billingsmeier Mercantile Co.	Maxwell
Benedict, Kan.	R. S. Benedict	King	Goldboro, N. C.	Ford Garage Co.	Haynes
Birmingham, Mich.	James E. Valentine	King	Holyoke, Mass.	Laduke Auto Exchange	Maxwell
Cleburne, Tex.	M. F. Feige	Partin-Palmer	Honesdale, Pa.	E. W. Gammell	Maxwell
Chillicothe, Tex.	J. W. Rose & Sons	Partin-Palmer	Hackensack, N. J.	Hackensack Auto Co.	Maxwell
Chatfield, Minn.	J. B. Ellis	Maxwell	Harbor Beach, Mich.	Dell McMann	Maxwell
Chester, S. C.	R. R. Hafner	Maxwell	Hopkinsville, Ky.	Forbes Mfg. Co.	Maxwell
Catskill, N. Y.	Amos Post	Maxwell	Hudson, N. Y.	Crescent Garage	Maxwell
Caledonia, Mo.	R. R. Bean	Maxwell	Idaho Falls, Idaho	Clay Automobile Co.	Haynes
Cottonwood, Cal.	Frank Butterway & J. E. Dilley	Maxwell	Indio, Cal.	Goldie Summers	Maxwell
Canfield, O.	Canfield Auto & Supply Co.	Maxwell	Ione, Cal.	E. G. Woolsey & C. T. Gowett	Maxwell
Colesburg, Ia.	Pech & Kocher	Maxwell	Independence, Kan.	Chaney & Passauer	King
Casper, Wyo.	Casper Machine Shop & Garage	Maxwell	Joplin, Mo.	Thos. H. Stults	King
Centralla, Mo.	Roberts Brothers & Green	Maxwell	Jamesport, L. I.	Fred B. Hallock	King
Cadillac, Mich.	H. N. Reinberg	Maxwell	Jefferson, Ia.	W. R. Adrian	Maxwell
Crestwood, N. Y.	A. S. Sargent	King	Kingsburg, Cal.	Robert Gustafson	Maxwell
Cleveland, Ohio	Dunham Motor Co.	King	Kalamazoo, Mich.	Frank Lems	Maxwell
Columbus, O.	F. Mayer	Lexington-Howard	Kiowa, Kan.	G. V. Wilson	King
Danvers, Ill.	Simpson Brothers	Franklin	Louisville, Ky.	National Cyclecar Co.	Zip
Dryer, Tex.	B. F. Schumacher	Maxwell	Lestershire, N. Y.	Chas. Wakeman	King
Danbury, Conn.	A. C. Penny	King	Lockport, N. Y.	A. L. Hoag	King
Dewey, Okla.	Pope Garage Co.	King	Lake Orion, Mich.	G. W. Bannister	King
Denver, Mo.	Bram Bros.	King	Lynchburg, Va.	Wm. Carter	Maxwell
Delta, O.	Blaine & Fraker	King	Lisbon, N. D.	J. G. Hyde	Maxwell
Dayton, O.	Powers & Summersett	Haynes	Lewisburg, Tenn.	Green Brothers & Chum	Maxwell
Ennis, Tex.	W. S. T. Shogog	Partin-Palmer	Loveland, Colo.	L. K. Alsbury	Maxwell
Estevan, Sask.	Frederickson & Green	Maxwell	Lake Charles, La.	A. M. Miller	Maxwell
Earlville, Ill.	Charles H. Sellers	Maxwell	Louisville, Ky.	Pathfinder Motor Car Co.	Pathfinder
Evanston, Wyo.	J. L. Wicks	Maxwell	Louisville, Ky.	Kentucky Motor Car Co.	Oldsmobile
East Hampton, L. I.	I. Y. Haslsey	King	Louisville, Ky.	J. R. Anderson	Merz
Elmont, L. I.	Hoeffner Bros.	King	Louisville, Ky.	George Fetter	Dudley
Eversonville, Mo.	S. E. Cook	King	Louisville, Ky.	National Cyclecar Co.	Zip
Elkader, Ia.	Dr. W. A. Miller	Franklin	Lima, O.	Central Garage	Moon

Of late years, Mr. Cosgrove has acted as a manufacturer's agent in London, Paris and Detroit.

Detroit, Mich.—The Tuthill Spring Co., Chicago, is now represented in Detroit by W. H. Frise who has the lower peninsula of Michigan as his territory.

Atlanta, Ga.—L. L. Barnes, formerly southern district manager for the Hudson, and Max Springer have formed the Saxon Motor Co., of Atlanta, and opened sales rooms and service station at 397 Peachtree street.

Hartford, Conn.—The Brassill Service Station has taken over the Dillon Court Garage, formerly conducted by Charles Yetter, the Stutz agent.

San Francisco, Cal.—The Stott-Strugnell Co. has entered the northern California field with headquarters in San Francisco. It will act as distributor of Batavia tires and the Motokart.

Waupaca, Wis.—N. P. Peterson, of Waupaca, Wis., is building a large garage, machine and blacksmith shop and storage warehouse in which will be incorporated a complete painting and trimming establishment.

Milwaukee, Wis.—The firm known as Auto Service has opened a new tire, supply and accessory store at 708 Third street under the name of the Auto Service and Supply Co. The new company has the agency for Miller tires in Milwaukee and vicinity.

Milwaukee, Wis.—The Consumers' Tire Co., Seventh and Wells streets, Milwaukee, Wis., has been appointed distributor for Acme tires and accessories. This line formerly was carried by the Billings Auto Tire and Supply Co., which has left the field.

Pontiac, Mich.—The Pontiac garage, owned by Albert & Endsworth, was destroyed by fire recently. More than thirty-five cars which were in the garage when the fire started were burned and the total loss to the owners is estimated at \$60,000. Owing to

frequent explosions of gasoline not a single car could be saved.

San Francisco, Cal.—Lyman Lacy of Los Angeles, formerly salesman for the E. Stewart Automobile Co., has started the Pacific Coast Auto Specialty Co. at 1441 Bush street.

Algoma, Wis.—E. A. Klatt has sold a half interest in his garage and agency business at Algoma, Wis., to Berl Ryder, Indianapolis, Ind., and the firm will hereafter be known as Klatt and Ryder Garage Co.

Indianapolis, Ind.—The W. and H. Auto Repair Co. has opened a general repair shop and rebuilding plant at 620 East Minnesota street. The company is a partnership consisting of A. V. Wagner and P. L. Hoeltke.

New York—The New York sales office and service station of the U. S. Light and Heating Co., formerly located at 210 West Fifth-street, has been transferred to the Locomobile building at 16-24 West Sixty-first street.

Montello, Wis.—The Gardner Automobile Co., Montello, Wis., has awarded contracts for the construction of a new garage, 50 by 90 feet in size and two stories high, affording room for the storage of 50 cars, in addition to display rooms and accessory store.

Richmond, Ind.—A. L. Bennett, formerly eastern sales manager for the Abbott Motor Car Co., will represent the Westcott Motor Car Co. in the same territory and make his headquarters with the metropolitan distributor, C. B. Derby & Co., 1862 Broadway, New York.

Columbus, O.—The Tesseyman Auto Co. is the name of a new concern formed by J. E. Tesseyman, formerly of the Ralston Steel Car Co., to handle the retail sales for the Studebaker line in Columbus and Franklin county. The sales rooms and offices are located at 215 North Fourth street. Fred Boyd, formerly with the Curtin-Williams

Automobile Co., is connected with the new concern.

York, Pa.—Charles K. Daron, South Queen street, in the carriage business for several years, has gone into the manufacture of commercial truck bodies.

Boston, Mass.—George G. Reed and Ather-ton C. Gosse, have formed a company to handle the Vulcan car in Boston. They have secured quarters at 1008 Boylston street, until recently occupied by the King branch.

Boston, Mass.—Ralph Ketchum, manager of the New England branch of the Kisselkar company at Boston, has resigned. He has been succeeded by George H. Lawrence, his assistant.

Chicago—The Gramm Commercial Car Co. has been organized here by E. C. Laura, A. L. Fell, A. D. Farwell and C. J. Holdrege to act as agent for Gramm trucks. A salesroom, service station and garage will be opened on East Huron street.

Detroit, Mich.—The Swift Auto Co., which operates a garage at 773 Gratiot avenue, has been declared a bankrupt by Judge Tuttle. The petition was filed by Fred C. and William Harft, alleging liabilities of \$1,574 and assets of only \$1,275.

Dayton, O.—Lee Ames has been appointed receiver for the Union Motor Sales Co., of Dayton, upon the application of William L. Tobey. The appointment was made by Justice Markey. Lucien Seward is president of the company which is said to be in financial difficulties.

Oak Park, Ill.—Will A. Pillinger has just completed the erection of a garage and salesrooms at Lake street and Austin avenue, Oak Park, and has taken over the Cook county territory for the sale of Davis cars. R. J. Kelly, formerly with the Fal Motor Car Co. and Kelly Wire Wheel Co., will have charge of the sales department and service station.

Recent Agencies Appointed by Motor Car Manufacturers—Continued

Town	Agent	Make
La Grande, Ore.	W. H. Bohnenkamp & Co.	Maxwell
Marietta, O.	Anderson Brothers	Franklin
Montreal, Can.	Jareau Motor Car Co.	Keeton
Montrose, Va.	Montrose Motor Co.	Maxwell
Mineola, Tex.	M. M. Dozier	Maxwell
Monticello, Ga.	F. E. Hecht	Maxwell
Manchester, Ga.	Davis & Crawley	Maxwell
Monmouth, Ill.	J. M. G. Jefferys & J. M. Lamme	Maxwell
Mineola, L. I.	Wm. Simonson	King
Morristown, Wis.	Salck & Groth	Maxwell
Maxwell, Ia.	Neil Auto Co.	Maxwell
Martinsville, Ill.	Grover Decker	Maxwell
Matamoras, Pa.	Lester Pitney	King
Moberly, Mo.	C. L. Leitch	King
Mason City, Ia.	M. R. Layman Auto Co.	Moon
Malta Bend, Mo.	Cole Bros.	King
Mendon, O.	E. J. Drake	King
Medina, N. Y.	E. B. Simonds	King
New Brunswick, N. J.	Harvey J. Moynihan	King
Northwood, N. D.	Thorsgard & Olson	Maxwell
North Yakima, Wash.	Bellingham Implement Co.	Grant
New York	C. B. Derby & Co.	Westcott
Norway Lake, Minn.	B. Halvorson	Maxwell
New Haven, Conn.	Wm. R. Moore	King
Normandy, Ky.	C. V. Stout	Maxwell
Oklahoma City, Okla.	John W. Lee	Franklin
Oswego, Kan.	J. F. Dean	King

Town	Agent	Make
Oley, Pa.	Oley Motor Co.	King
Oshkosh, Wis.	Oshkosh Auto Co.	Maxwell
Orchard Hill, Ga.	Oscar Atkinson	Maxwell
Oshkosh, Wis.	A. E. Hamley	Maxwell
Punxsutawney, Pa.	Whiteman & Co.	Franklin
Poughkeepsie, N. Y.	Horace Sague & Son	King
Pt. Chester, N. Y.	Lowden & Flint	King
Paterson, N. J.	James C. Gould	King
Palestine, Ill.	G. B. Mullen	Maxwell
Patch Grove, Wis.	West Grant Auto Agency	Maxwell
Palmyra, N. Y.	Albert B. Reynolds	Maxwell
Pella, Ia.	Ever-Ready Auto Co.	Maxwell
Portland, Ore.	Nob Hill Garage	Haynes
Portsmouth, N. H.	C. A. Badger	Franklin
Perkasie, Pa.	J. Samuel Bowen	Maxwell
Ray, Ind.	McNaughton & Warner	Maxwell
Ravena, N. Y.	Joralemon Brothers	Maxwell
Red Bluff, Cal.	A. A. Curtis	Maxwell
Reynolds, Neb.	R. A. Bothwell	Maxwell
Regent, N. D.	Show & Boe	Maxwell
Rhineland, Wis.	T. C. Wood Hardware Co.	Maxwell
Ridgway, Mo.	Curtis & Francis	King
Saranac Lake, N. Y.	Shelley Tool Co.	King
Spokane, Wash.	Ross & Williams	Haynes
Shawnee, Okla.	Auto Supply & Garage Co.	Franklin
Sistersville, W. Va.	Diamond Garage	Franklin
Sylvia, Kan.	G. A. McPherson	King

COMMERCIAL CARS

Arbuckle, Cal.	A. J. Atran	Menominee
Astoria, Ore.	Earl Fisher	Menominee
Aberdeen, Wash.	F. & F. Garage	Menominee
Byron, Cal.	Byron Garage	Menominee
Chehalis, Wash.	Twin City Auto Co.	Menominee
Corvallis, Ore.	M. A. Rickard	Menominee
Concord, Cal.	Jos. Boyd	Menominee
Everett, Wash.	Knowles & Co.	Menominee
Eugene, Ore.	J. A. Wetzel	Menominee
Fresno, Cal.	E. E. Bradley	Menominee
Fortuna, Cal.	Leach & Smith	Menominee
Grant's Pass, Ore.	J. H. Williams	Menominee
Hanford, Cal.	Buckner & Schellabarger	Menominee
Marshfield, Ore.	George Goodrum	Menominee
Newark, N. J.	Walter Schuman	Menominee
Nevada City, Cal.	Alpha Hardware & Supply Co.	Menominee
Olympia, Wash.	J. B. Eshom	Menominee

St. Joseph, Mo.	J. M. Nichols	Menominee
Salisbury, Md.	Peninsula Motor Co.	Menominee
Spencerport, N. Y.	Walter Havens	Menominee
Santa Cruz, Cal.	J. O. Cedar	Menominee
Seattle, Wash.	Gerlinger Motor Car Co.	Menominee
Salem, Ore.	B. G. Boedigheimer	Menominee
Spokane, Wash.	Hawkins Motor Car Co.	Menominee
Bellingham, Wash.	Union Auto Co.	Menominee
Thurston, Ore.	Ross Mathews	Menominee
Trenton, N. J.	Motor Shop	Stewart
Tacoma, Wash.	Pacific Car Co.	Menominee
Tracy, Cal.	Fabian-Grunauer Co.	Menominee
Visalia, Cal.	Coats Brothers	Menominee
Vacaville, Cal.	Carl Crystal	Menominee
Woodland, Cal.	Electric Garage	Menominee
Willows, Cal.	O. A. Klemmer	Menominee
York Village, Me.	R. S. Blaisdell	Stewart



The Motor Car Repair Shop



HOW to get more power out of the car seems to be a general topic among many owners of small roadsters and not a few are at this late date willing to give up much of their time tuning up the car for speed.

The first step in increasing car speed is to decrease the weight of the vehicle as much as possible, removing all unnecessary, that is, non-essential, equipment. Since wind resistance is a great factor in reducing speed, it becomes evident that every effort should be made to streamline the car. A long tapering hood coming almost to a point, as in some racing cars, is good. Just enough space should be left in front to allow air currents to reach the radiator. The object of all this streamlining is to reduce the resistance to wind of the car to a minimum. Just as a piston going downward in a cylinder creates a vacuum so a car going along a road has a vacuum behind it. This condition retards the speed of the vehicle and any means adopted for reducing this vacuum, or, better still, partial vacuum, will increase the car speed. It is considered more important to care for the rear of the car than it is to look after the front.

Speeding Up the Engine

After the parts have been streamlined as much as possible the mechanical end should be considered. If possible, the valve seats should be increased in size and new and larger valves obtained. If only the intake valves can be made larger, it is a good idea to do so. Increasing the size of the valve seats may be done with a counterbore, or an oversize valve re-seating tool. New valves may be purchased at a comparatively low price. The lift of the valves may be increased slightly by substituting larger cams. The magneto should be reset so that the advance occurs one-eighth or even one-fourth earlier than it does at present. Much will depend upon conditions as to just how the magneto shall be reset. Setting the magneto ahead in this way will cause the motor to stop if the throttle is set down too far. If it is possible to use a larger carbureter and intake header it is best to do so, for if the intake valves are made larger more mixture can be accommodated. The frictional loss in the motor is reduced somewhat by removing one of the piston rings, but if the pistons have but two rings this should not be done. Lighter pistons help matters materially. Some use magnalium, semi-steel or steel, while others take the old pistons and drill holes in them. Care should be taken in doing this work, that each piston weighs the same as any other piston. If possible use lighter connecting rods, but it would not do to

Increasing the Car Speed

remove metal from the old ones, for the strength may be impaired. New rods of stronger metal and thinner section, or hollow rods, are better.

One of the first essentials for a speedy car is to have a pressure oiling system with a hand control on the dash or other place within easy reach of the driver. This consists merely of a hand pump drawing oil from the tank and forcing it to the crankcase. Ball check valves properly placed can control the direction of flow.

In nearly all racing cars the motors are equipped with magnetos of the double-distributor type, so that they feed to two sets of spark plugs at the same time. This system is most helpful in a T-head motor, but is valuable as well in L-head or I-head motors. In the former the best results are obtained, for then the plugs are on opposite sides of the cylinder and hence flame propagation is more rapid. The L-head comes next. It is not always possible to place two plugs in an I-head cylinder; all depends upon the construction, but if possible the plugs should be threaded on opposite sides of the casting.

A reduction in gear ratio to not more than $2\frac{1}{4}$ to 1 will show good results with almost any motor properly tuned up, but much depends on the ability of the engine. The springs should be bound with fishing cord; but before the cord is applied graphite should be placed between the spring leaves. The cord is wound tightly over the spring and about three layers used.

Careful Inspection Necessary

One or more of the aforementioned suggestions may be put into practice and good results will be obtained. Another important point which must not be overlooked and one which is valuable to the touring car owner also, is that all the parts which are liable to loosen should be inspected and cared for. The ignition wires, for example, should not be left loose. If in a conduit, they should be held firmly together at a point midway between the conduit and the magneto. All nuts should have a plain washer and a lockwasher placed under them if possible. Always place a plain washer under a lock or spring washer.

See that the gasoline tank is firmly fastened and that the gasoline line has no possible chance of rubbing against the frame or other part of the car. Examine the steering post and see that it is securely attached. Motor Age will be glad to give special information on any particular type of vehicle of which greater speed is desired.

Many cars have the electric horn button on the steering wheel and the wires from

the button wind around the steering post and extend through the dash or cowl to the horn under the hood. At some point a metal clip is used to hold the wires in place. The turning of the steering wheel may, in time, cut the wires, because the end attached to the steering wheel remains stationary while the others must give slightly. If sufficient slack is not allowed the wires soon become cut, an open circuit results and the horn will not operate.

In an extreme case which came up a few days ago, an owner complained that neither his horn nor his lights would operate and only the day previously the battery was taken from the charging table and the posts thoroughly cleaned. The repairman handling the job made one move—he lifted the cover of the battery box—and the cause was evident immediately. A pair of pliers was lying across the top of the battery and the accumulator was short-circuited. One end of the pliers touched the positive terminal and the other end touched the battery box. The pliers were used to tighten the nuts holding the cables.

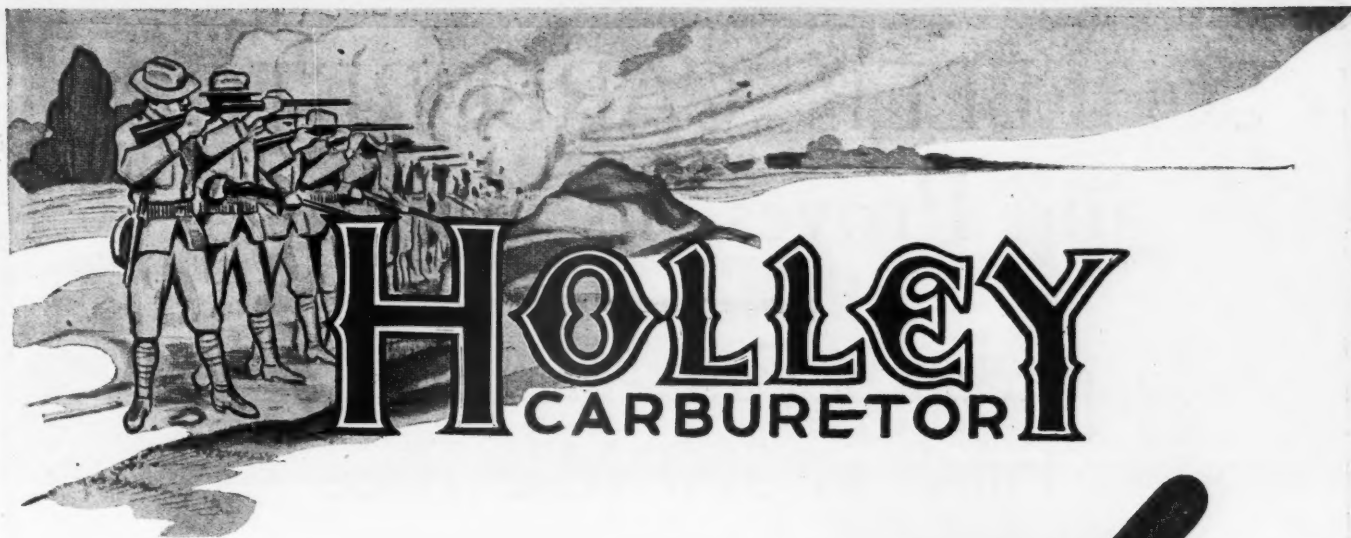
The importance of using clean gasoline in the tank cannot be emphasized too strongly. Water and dirt in the fuel will not only cause poor motor operation, but on a recent trip the motor stopped completely. In the case in question there was about 1 inch of fuel in the tank and by looking through the filler cap one could see dirt all over the bottom of the tank.

Instead of attempting to crank the motor and thus have the remaining dirt flow to the carbureter, 10 gallons of gasoline was procured and put into the tank. The added gasoline caused the dirt to mix thoroughly. After draining the gasoline line the motor could be started, but it misfired. When the car was brought to the garage all the fuel was drained, the tank flushed out three or four times, the fuel line cleaned by forcing air through it and the gasoline was then strained twice before it was placed into the tank.

Watch the Wheels

Misalignment of the wheels is an expensive ailment of the car and one not always noticed until considerable damage is done to the tires. In a recent case in which an owner had driven a new car less than 1,000 miles he noticed that his front tires were wearing much more rapidly than the rear one. At 1,000 miles the tread had worn down to the fabric, and it was a case of retreading if the tires were to be preserved.

A visit to the service station of the car maker brought out the announcement that the wheels were out of line, and when this was corrected the abnormal wear stopped. Frequent inspection of the wheel alignment often will save tire wear.



GUN makers have found springs most unreliable.

They have not been able to perfect a spring that is not affected by heat or cold.

They say that it is not unusual for the main spring of the gun to snap into pieces, even when the gun is not in use.

Springs become weak and treacherous.

According to the Encyclopedia Britannica, some military rifles have been absolute failures because of the unreliable features of their springs.

Springs are used in gun locks because nothing better has been found to take their place.

Springs have been used in carburetors for the same reason until recently.

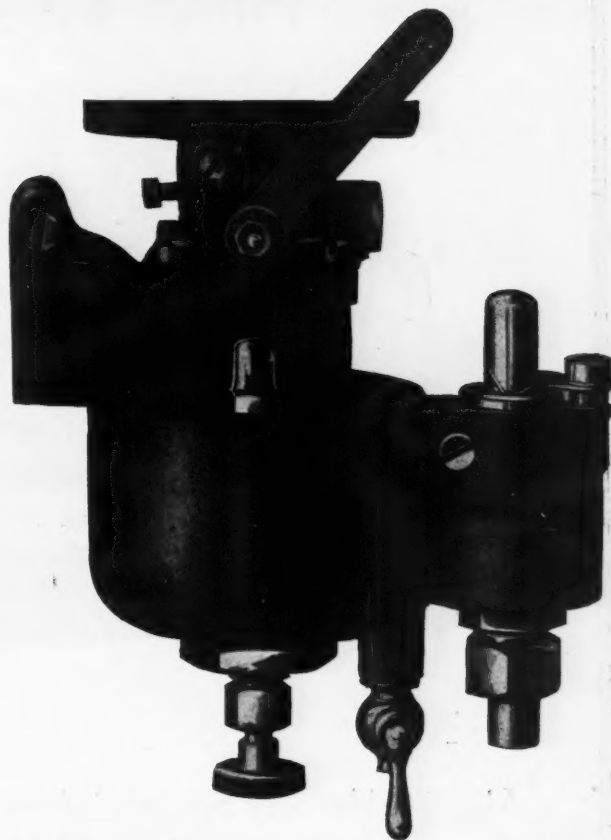
The new self-adjusting Holley has no springs.

It depends entirely upon natural forces of gravity and air pressure for its operation—hence, it is accurate and reliable.

225,000 now in use.

One on your car will pay for itself in 5,000 miles of driving.

See our nearest dealer or write direct to



REO ACCESSORIES CO., 1220 Michigan Ave. Chicago, Ill.
OMAHA RUBBER CO. Omaha, Neb.
H. F. BROWNELL CO. Sioux Falls, S. D.
HUGHSON & MERTON, 530 Golden Gate Ave. San Francisco, Cal.
Foreign Branch: HOLLEY BROS. CO., Coventry, England.

BRANCHES:

Los Angeles, Cal. Hughson & Merton, 1229 So. Olive St.
Portland, Ore. Hughson & Merton, 329 Ankeny St.
Seattle, Wash. Hughson & Merton, 924 East Pike St.
Holley Carburetors are carried in stock at the following addresses:
CHAS. E. MILLER, Home Office: 97-103 Reade St., and 121 Chambers St., New York.

BRANCHES:

New York City 924 Eighth Ave., between 54th and 55th Sts.
New York City 2782 Broadway, between 107th and 108th Sts.
Springfield, Mass. Bridge and Dwight Sts.
Hartford, Conn. 274 Trumbull St.
Atlanta, Ga. 66 Edgewood Ave.
Brooklyn, N. Y. 1421 Bedford Ave.
Buffalo, N. Y. 824 Main St.
Albany, N. Y. 185 Central Ave.
Boston, Mass. 202-204 Columbus Ave.
Detroit, Mich. 227-229 Jefferson Ave.
Cleveland, O. 1829 Euclid Ave.
Philadelphia, Pa. 318 No. Broad St.
New Orleans, La. 601-603 Baronne St.
Newark, N. J. 274 Halsey St.

Holley Brothers Company

Detroit

Michigan

When Writing to Advertisers, Please Mention Motor Age.

SCHEBLER CARBURETOR Again Proves its Supremacy

Equipment of First American Car to
Finish in 500 Mile Race



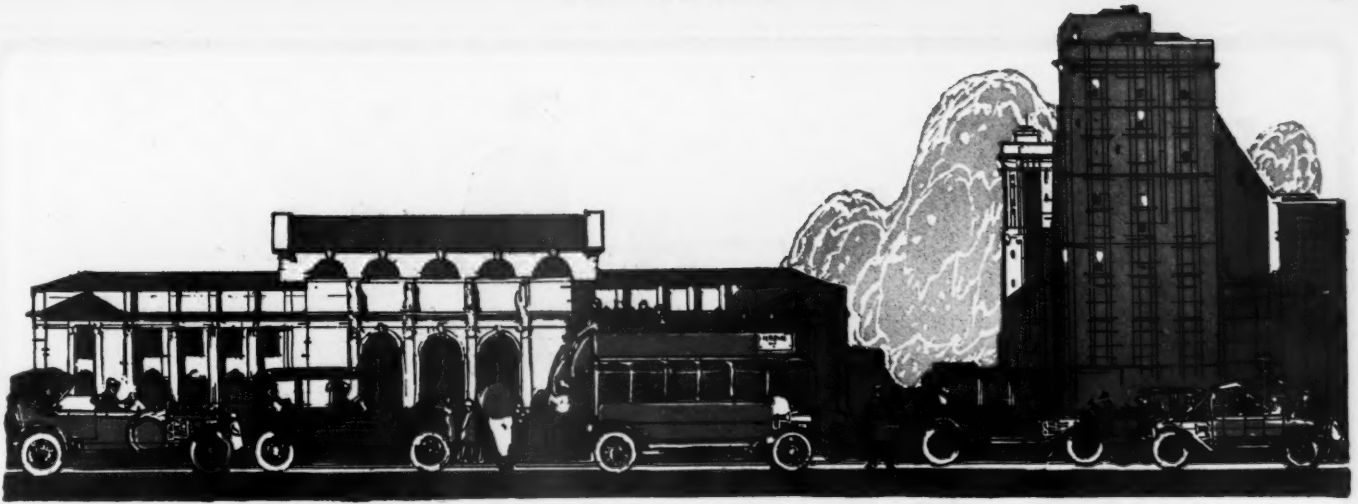
Also Schebler only Special Carburetor Equipment of a Foreign Car Winning—
When a Driver Must Have Speed and Durability he Demands the Reliable

SCHEBLER

WHEELER & SCHEBLER

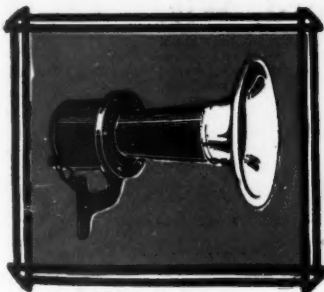
"Pioneers in Perfection of Carburetion"

INDIANAPOLIS, IND.



“At the corner of Fifth Avenue and Forty-second Street I counted forty-two automobiles (not counting taxi-cabs.) Forty-one carried Klaxons.”

—William Allen Johnston, Esq., 127 West 82nd St., New York, in a letter to the Klaxon Makers.

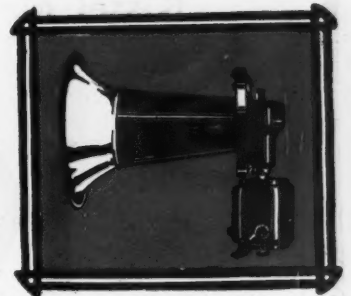


KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

“The Public Safety Signal”



KLAXON

This advertisement planned, written and set up entirely in the Klaxon Factory. Type composition by the Klaxon Press with “Klaxon” type especially designed by Goudy.
When Writing to Advertisers, Please Mention Motor Age.

Every Inch a Car



This New Two-Door Design Has Captured the Motoring Public

STUNNING—That's the verdict wherever the new KisselKar 48 "Six," with its swagger two-door tonneau, has been shown.

Only one compartment—only two doors—it's enough for the fullest comfort and convenience, and at the same time permits grace and beauty of design impossible under any other construction.

Those who want a four or five passenger car and who desire to be strictly up-to-the-minute, will be impressed immediately with this two-door 48 "Six."

NOTE THESE STERLING MECHANICAL MERITS: A wonderful 4x5½ motor; unit power plant; four speed transmission; Mayo radiator; big valves, bearings and brakes; 2½-inch three-quarter elliptic springs in the rear; 132-inch wheelbase; Warner speedometer; Kissel self-starter; "one-man" top; Klaxet horn—in short, all the attributes expected in a car of quality.

The purchaser of a 48 "Six" may have the conventional four doors if he so desires, this type being offered in either five or seven passenger models.

The price of the 48 "Six" with either two-door or four-door body is \$2350. Wire wheels, \$70 additional.

See the new 48 "Six" today. You will be delighted with its sturdiness, its simplicity, its riding qualities, its all-around excellence.

Kissel Motor Car Co., 121 Kissel Ave., Hartford, Wis.

BOSTON, NEW YORK, CHICAGO, MILWAUKEE, KANSAS CITY, MINNEAPOLIS, ST. PAUL, DALLAS, SAN FRANCISCO, LOS ANGELES, OAKLAND, Philadelphia, Salt Lake City, Detroit, St. Louis, Houston, El Paso, New Orleans, Washington, Baltimore, Nashville, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Rochester, Providence, Marshalltown, Iowa; Omaha, Hastings, Nébr.; Madison, Montreal, Quebec, Toronto, Winnipeg, Calgary, and 300 other principal points throughout America.

KISSELKAR



STORAGE BATTERIES and BATTERY SERVICE

May Be
Obtained in
Detroit

Factory Branch at
736-740 Woodward Avenue

These photographs furnish but a faint idea of our facilities for affording service to manufacturers and **LBA** users in Detroit.

FOUR OTHER FACTORY-OPERATED BRANCHES carry complete stocks of batteries and parts and maintain ample charging and repair service.

OVER 200 SERVICE STATIONS in the United States and Canada insure the utmost satisfaction to users of **LBA** Storage Batteries everywhere.

LBA Willard Storage Battery Co., Cleveland, Ohio **LBA**

New York Branch: 136 W. 52d St.
Chicago Branch: 2241 Michigan Ave.

Detroit Branch: 736-740 Woodward Ave.
San Francisco Branch: 821 Monadnock Bldg.

Indianapolis Branch: 318 No. Illinois Ave.

SERVICE STATIONS IN ALL PRINCIPAL CITIES IN THE UNITED STATES, CANADA AND MEXICO

(104)

Charging Room

Detroit Branch

Forty-six

Charging

Stations

afford facilities for
charging over 1,000
Starting and Lighting
Batteries at a time.

10,000 batteries
carried in stock
at this branch





This 3-Ton **GMC** Electric Truck delivers six loads of water pipe per day, six pieces to the load; where formerly one team could only deliver three loads of two pieces each per day. Therefore, the truck is doing the work of six teams

In municipal and public utility service **GMC** Gasoline and Electric Trucks have done splendid work.

In road-building, street-flushing, police assignments, electric light work and general hauling, they have well illustrated the big advantage of making the truck fit the service.

This advantage is two-fold—It means first, truck performance that is absolutely satisfactory, and second, the lowest possible operating

expense for the work required.

GMC Trucks are built in both gasoline and electric powers and in capacities from 1000 pounds to six tons—a truck for every purpose.

Wherever there is a municipal or mercantile transportation problem to be worked out, the solution can be found in the comprehensive **GMC** line.

Further facts from our nearest distributor or direct from the factory.

Correspondence invited with dealers of financial responsibility.

GENERAL MOTORS TRUCK COMPANY

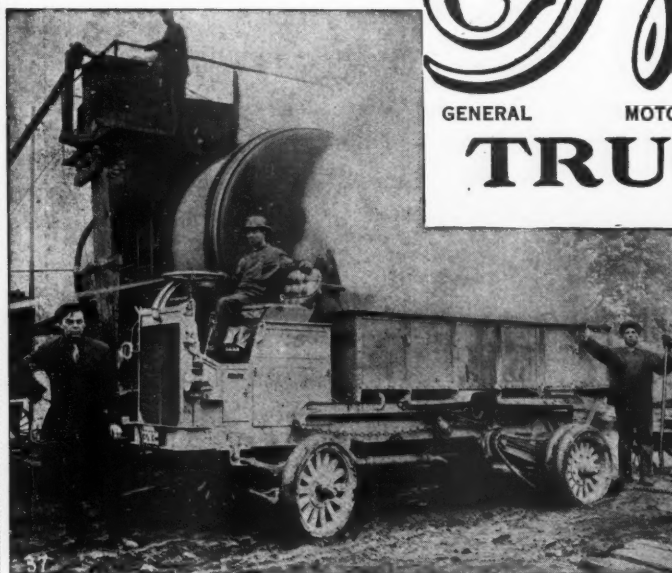
One of the Units of General Motors Company
Pontiac, Michigan

Branches and Distributors
New York, Boston, Philadelphia, Detroit,
Chicago, Kansas City, St. Louis,
Portland, San Francisco



GENERAL MOTORS COMPANY
TRUCKS

Branches and Distributors
Seattle, Los Angeles, Pittsburg, Min-
neapolis, Salt Lake, Galveston, New
Orleans, Birmingham, Denver



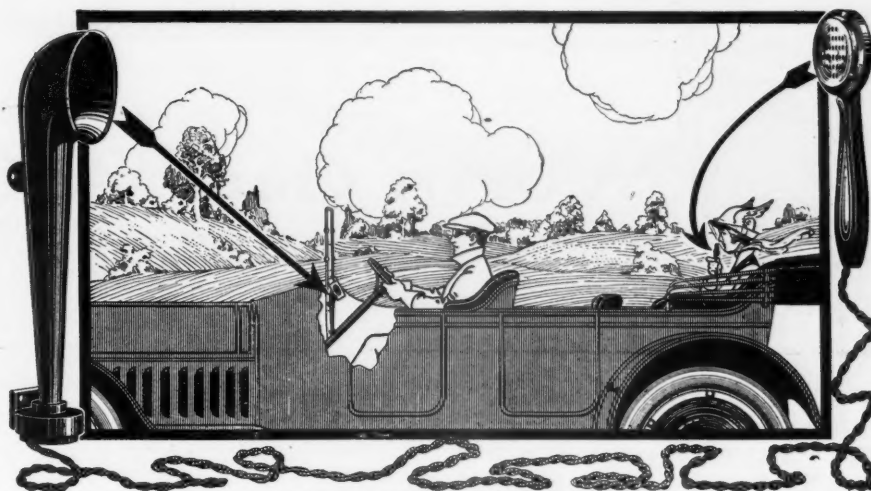
GMC Model KD 5-Ton Automatic Dump being loaded with hot asphalt



GMC Model KD 5-Ton Automatic Dump Truck. The dumping mechanism can be operated while truck is in motion

When Writing to Advertisers, Please Mention Motor Age.

DEALERS—



INSTALLED ON OPEN CAR

This Wonderful New Device Demonstrates Itself—Tells Its Own Story—Closes the Sale—and

**YOU
TAKE THE
PROFIT**

The Stentor Autophone is an electrical loud speaking receiver and transmitter, enabling the occupants of front and rear seats to communicate clearly and distinctly.

Voices are Reproduced faithfully and clearly without distortion. Ordinary conversation may be carried on regardless of noise and traffic conditions.

The Stentor Autophone is constructed on the same principle as our device now used by Railroads for train dispatching.

Is Adaptable to Closed or Open Cars, May be Attached to top of steering post, imbedded in sub dash or attached to side. On closed cars it supplants the speaking tube.

Wherever Introduced the Stentor Autophone is instantly indorsed—you will find it the fastest selling and most profitable accessory in all motordom.

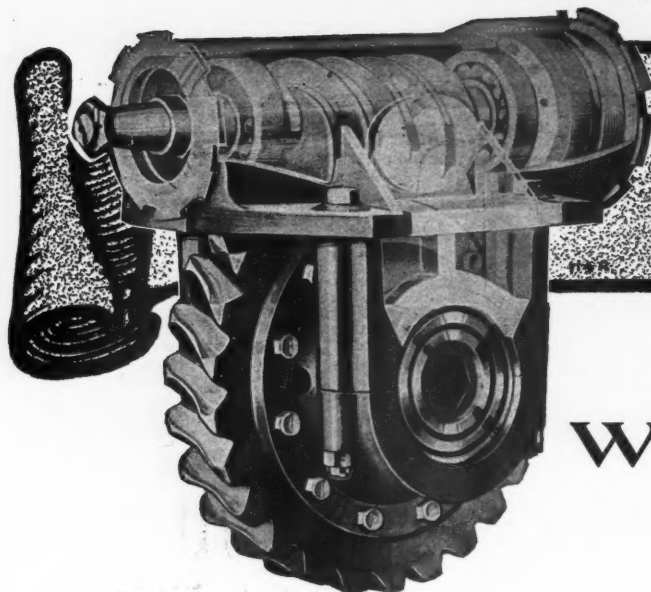
We have an introductory sales plan to cover each Territory. Tell us where you are located.

Efficiency Sales Company, Inc.

42 BROADWAY

Department A

NEW YORK CITY



SHELDON

Worm Gear Axles Front Axles

BYOND any question and wholly within the bounds of demonstration Sheldon worm gear axles are the most efficient axles of this type known to the motor car industry. In Sheldon axle construction this most important feature of the worm gear principle—efficiency—the carrying of the maximum of power to the rear wheels—is developed to the greatest degree.

This condition is brought about primarily through the fact that the worm is mounted upon two annular ball bearings with the thrust load taken care of by a separate self contained thrust ball bearing.

In succeeding advertisements we shall show in detail, point by point, just why we use ball bearings throughout our worm gear axles. At this time just let us say briefly and emphatically that it is this particular feature of design that in greatest degree enables us to prove under actual test the unquestioned superior efficiency of the Sheldon worm gear axles. And let us say further that in the selection of ball bearings for both radial and thrust load carrying we have not acted arbitrarily. Ball bearings have been decided upon only after the severest and most exhaustive tests. We are frank to admit that foreign practice influenced us primarily in this regard. We noted that foreign manufacturers used ball bearings in their worm gear construction. Knowing that they had had by far the greatest experience with this type of axle we were naturally impressed by this fact. Subsequent tests have shown us conclusively that a worm gear axle can realize its full measure of efficiency only by the use of ball bearings for carrying both radial and thrust loads.

The explanation of this statement lies in the fact, first, that ball bearings are the most nearly non-friction of any type of bearing—secondly, that by virtue of their ability to carry the greatest load with the least amount of material (that is—a ball bearing of ample capacity requires less space than any other type of bearing) they make possible the construction of the lightest weight axle—and thirdly, the use of ball bearings enables us to produce an axle in which there are no adjustments—because no adjustments are ever required.

As we have said before, this campaign has been entered into with the idea of thoroughly familiarizing not only the industry itself but everybody interested in the advancement and development of the motor car industry as well, in the superiority of Sheldon products in general and especially in its worm gear axles. However, if our plan of taking up point by point the features that make for the superiority of our products does not get the information to you quickly enough we will gladly go into details personally and immediately with anybody who requests us to do so, whether you are in the trade or not. So don't hesitate to write us upon any question.

SHELDON front axles are important. They are designed and built with such precision that breakdown is reduced to a minimum. They embody more different and better front axle points than does any other design. Remember this concern is now supplying the largest percentage of the front axles used on commercial trucks, proving that engineers and designers realize the importance of getting the best at the point where stresses are the most severe. There is also an interesting story on the front axle proposition awaiting you here.

Sheldon Axle Company

Makers of Springs and Axles for Heavy

Chicago, Peoples Gas Bldg., 122 S. Michigan Blvd.

San Francisco,

SHeldon



Springs

Brake and Radius Rod Equipments

In considering the question of a motor car from any viewpoint whatsoever—manufacturing, buying or selling—just keep one thought in mind always—

Upon the springs which carry the bulk of the car rests the greatest possible responsibility looking to both comfort and economy. Remember that it is the springs first that determine the riding qualities of the car—that it is the springs that play the most prominent part in the protection of your motor and other working parts from the shocks and vibrations of road usage.

So, again, this warning—Look to your springs.

SHELDON brake equipment locates both brakes on the rear wheel, avoiding all unnecessary strains imposed by brakes located on jack shafts and propeller shafts. The braking power takes the shortest cut to the wheels. Sheldon brakes are absolutely positive, always take hold, insure long wear, can be depended on at all times, eliminating danger to both driver, pedestrian and machinery. Sheldon brake and radius rod equipments have stood the test of severe service. They can be supplied in sizes for all types of service.

Unfortunately springs have been neglected — as a detail. To the average person in and out of the industry "springs" are just "springs." But believe us when we say "springs" are not just "springs." There are "springs," and "springs," and "springs" — and then

There are Sheldon Springs.

And we purpose

showing the whole industry as well as those who support it, if it's humanly possible, just what we mean when we draw this sharp distinction between just "springs" and Sheldon Springs.

There is a sound logical reason why Sheldon for more than 50 years has dominated the spring making industry for vehicles of all types, both in quality and quantity—and unless all signs fail the time is here right now for an exposé of these sound, logical arguments concerning the dominancy of Sheldon Springs.

In the first place, the raw material which is made into Sheldon Springs is compounded over a special formula of our own shown by our years of experience to be the most efficient in spring manufacture. Every shipment of this steel as it reaches us in the rough is carefully tested by chemical analysis, so that we may be certain of its being compounded absolutely according to our specifications.

The heat treating of all Sheldon Springs is done in specially constructed furnaces equipped with pyrometers. These instruments measure and record exact temperatures so that they enable us to produce a uniform product—that which in some other manufacture is left to fallible human guess. In the heat treating processes even the baths in which the steel is quenched after being heated are chemically analyzed to keep them in uniform condition. Then after the springs are finished they are constantly tested for hardness, toughness, brittleness, bending, tension, twisting, shock and endurance to be sure that every process in the manufacture has been accurately carried through. These remarkably careful manufacturing methods are supplementary to the most thorough, competent and complete engineering and designing to be found anywhere in the world of spring manufacture.

As we have repeated above, the statements herewith are broad generalities but all easily demonstrable facts, which we will verify specifically as this educational campaign goes on. In the meantime we have a vast fund of data at hand which we will be glad to submit to anybody upon request. If you are interested won't you let us hear from you?

by **Wilkes-Barre, Pennsylvania**

heavy **Duty Service for More Than Fifty Years**

San Francisco, **444 Market St.**

Detroit, 1215 Woodward Ave.

\$1595 CHANDLER

LIGHT-WEIGHT SIX For 1915

Better Motor Car Value Than Ever

FOR the new 1915 Chandler we have established the altogether remarkable profit-sharing price of \$1595. Trade and public alike will receive this announcement with surprise and enthusiasm. There are no radical changes in design. There could not be, for the Chandler had already attained what was recognized as the ultimate in engineering. And there are no experiments in the 1915 Chandler.

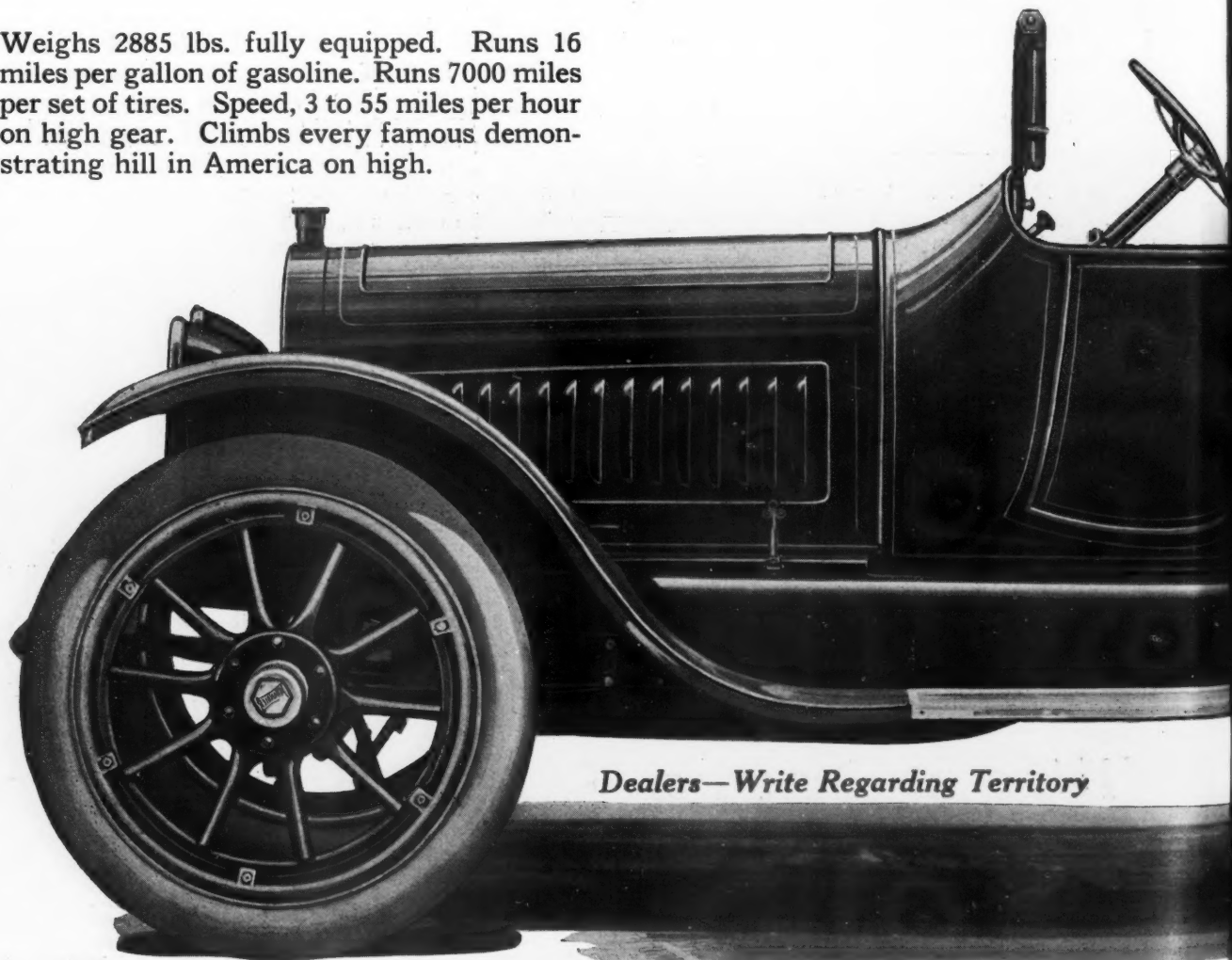
But, throughout the car, we have effected refinements. We have added 10% to the power.

Our engineers and designers have effected many improvements.

The 1915 pure stream-line body, sweeping in unbroken lines from the bow of the tonneau to the deep Mayo radiator, gives the Chandler the last word in motor car beauty. And the profit-sharing price is \$1595.

If anybody had told you, two years ago, that in the summer of 1914 you could buy a high-grade, six-cylinder automobile with a powerful long-stroke motor—designed by men who for years had built the finest six-cylinder car in America—with 120-inch wheel base and a really roomy body and the finest equipment for starting and lighting and ignition and all the other functions of a car, and with beautifully finished body and deep-cushioned upholstering for \$1595—if anybody had told you this, two years ago, you would have thought him the King of Dreamers. And yet this is the very thing that has come true!

Weights 2885 lbs. fully equipped. Runs 16 miles per gallon of gasoline. Runs 7000 miles per set of tires. Speed, 3 to 55 miles per hour on high gear. Climbs every famous demonstrating hill in America on high.



Dealers—Write Regarding Territory

Chandler Motor Car Co., 206-236 E. 131st St., Cleveland, Ohio

When Writing to Advertisers, Please Mention Motor Age.

CHANDLER \$1595

LIGHT-WEIGHT SIX For 1915

at a Sensational Profit-Sharing Price

In fixing this price for the 1915 Chandler, we are simply dividing our profits and sharing our prosperity with Chandler purchasers.

Chandler production is increased two-fold for 1915. Chandler overhead expense, which already is, we believe, lower than that of any other manufacturer building cars of competing character, will be still further decreased by this larger production. We are giving part of the benefit of this to the men and women who want to own Chandlers, and to our dealers, by providing them with a new model of such high value and at such low price that their work of selling will be reduced practically to a matter of filling orders.

You will probably see, very shortly, the announcement of new models for 1915 by other makers. You will read of many radical improvements; you will read of this or that manufacturer putting on the Bosch Magneto, for instance, or installing a separate unit lighting and starting system or using imported annular ball bearings, or replacing heavy iron castings with aluminum parts, or any one of a dozen other things that you have a right to demand in the motor car you buy.

But we cannot announce radical improvements because there isn't a single one of these things that we can put on the Chandler. They have all been on the Chandler for a year past. The Chandler has been distinguished by the fact that throughout, in its equipment, it has possessed all of those high-grade features found on the very highest-priced cars.

And now, with the refinements and increased power of the 1915 model, we do not believe the market will offer any like value at a similar price.

There is a Chandler dealer in every principal city in the United States and in many smaller cities and towns. If you know your Chandler dealer get in touch with him right now and place your order for the 1915 Chandler without delay. If you don't know him, write us today for catalog and booklets which tell all about the Chandler and what Chandler owners say of it.



Chandler Motor Car Co., 206-236 E. 131st St., Cleveland, Ohio

When Writing to Advertisers, Please Mention Motor Age.

**HAS NO EQUAL
FOR SPEED
AND POWER**

**ABSOLUTELY
GAS
TIGHT . .**



**INDESTRUCTIBLE
INSULATION**

Mosler **Vesuvius** **Plugs**

**EASILY TAKEN APART
AND REASSEMBLED
ABSOLUTELY GAS TIGHT**

Note Ears on Collar

The Only Plug That

Has Means For Assembling

Without Rotating the Insulator

The Washer and Ears Take Up

All the Friction of the Nut

And Give

The Direct Straight Pressure

Which Makes the Plug

Absolutely Gas Tight

A · R · MOSLER & CO
NEW YORK · · · N · Y ·

PREMIER



A NEW SERIES—6-49 1915 AND A NEW PRICE \$2385

F. O. B. Indianapolis

A New Standard of High-Grade Automobile Value

The 1915 6-49 has a UNIT POWER PLANT;
THREE-POINT SUSPENSION, ELECTRIC
LIGHTS and STARTER, LEFT SIDE DRIVE,
ONE MAN TOP, STREAMLINE BODY, and the
power to provide the snap, getaway and energy
demandd by discriminating automobilists

Our best sales argument is to suggest that you compare it, part for part, with any car offered the public at a higher price today—then ride in it and experience the smoothness, ease of riding, comfort, power, and speed if you want it.

The early production of our 1915 model gives the dealer a valuable lead on the market. Write us for particulars on open territory.

George Weidely never built a better car

PREMIER MOTOR CAR CO., Indianapolis



You won't get caught speeding if you watch this Stewart Speedometer

A real "Stewart" with special equipment for Ford cars

Held up by a motorcop! Hauled into court for speeding the very first day you drove your "Ford"! Didn't have a Stewart Speedometer—"guessed" your speed—"guessed" only a couple of miles wrong. But the motorcop did *not* guess. He had a "Stewart." He *knew*—and enforced the *very* letter of the law.

Time and again, the Stewart Speedometer will save you the humiliation of arrest for breaking speed laws. And one such fine is usually higher than the price of this "Stewart."

Don't drive your "Ford" another mile without this Stewart Speedometer. Get it today from your Ford dealer, or from any garage, supply dealer, jobber, or from any of our Branch Houses or Service Stations. If bought at our Branch Houses, the installation is free.

This is a genuine Stewart Speedometer—"Magnetic Type" same as our Speedometers on 95% of all cars made—60 mile rotating speed dial—10,000 mile Season

Odometer—100 mile Trip Odometer with reset device for resetting to any mile or tenth of a mile—jeweled bearings—beautifully finished in deep jet lacquer with polished brass trim to match your "Ford." Price, with complete equipment for installing on your "Ford," only—

30 Days' FREE Trial

Have this Stewart Speedometer put on your "Ford" at once and try it for 30 days. Any dealer is authorized to return your money to you within 30 days if this Speedometer does not prove satisfactory.

\$12

Stewart-Warner Speedometer Corporation

Executive Offices: 1931 Diversy Boulevard, Chicago

17 Branches, Service Stations in all cities and large towns

EISEMANN

Stock Eisemann Magnetos with Automatic Spark Control were used on the 94 Franklin Sixes that averaged 32.8 miles per gallon of gasoline in their National Economy trial held May 1. In this test held all over the country eleven Franklins averaged better than 40 miles per gallon and the poorest showing of the 94 was 17.2 miles per gallon made in a fierce wind and rain storm.

That Eisemann Magnetos played an important part in this wonderful showing there is no gainsaying. For of prime importance in all questions of economy is perfect performance of the ignition system. And more. To insure greatest economy not only must the ignition perform perfectly—but the timing of the spark—its advance, its retard—must be in absolute correct relation to the engine speed.

So the "Eisemann" with Automatic Spark Control just naturally and logically fitted into this remarkable test. Fitted in because here is the one magneto in the entire industry in which the proper timing of the spark is positively and automatically controlled by the speed of the motor and with its every slight variation.

Nothing left to fallible human guesswork—every variation accurately and positively controlled by the speed of the engine geared to the magneto itself.

Just another evidence of Eisemann efficiency, dependability and durability.

Stock Eisemann Magnetos
used on Franklin Sixes
in National Economy test

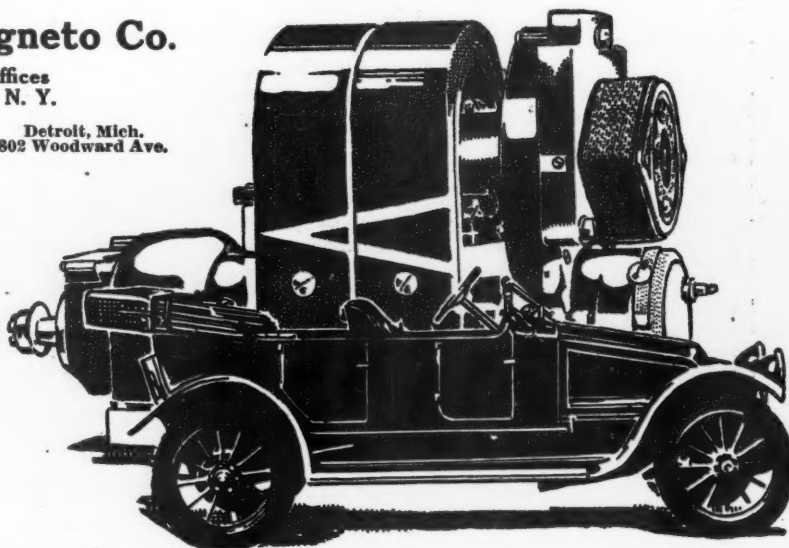
The Eisemann Magneto Co.

Sales and General Offices
32-33d St., Brooklyn, N. Y.

New York
123 W. 52d St.

Indianapolis, Ind.
514 N. Capitol Ave.

Detroit, Mich.
802 Woodward Ave.



The PUSH - THE - BUTTON CAR

for
1915

Announcement

To those who are interested in the most up-to-date motor car in the world.

There never has been a car since the beginning of the automobile industry which created such a favorable impression and made such instantaneous friends as the 1914 PULLMAN LITTLE SIX. To this remarkable automatic Push-the-Button Car with its every conceivable comfort, a few refinements suggested by the year's experience have been added. After surveying all the finest motor cars built we were unable to discover anything but minor changes possible in the improvement of this car.

Pullman
6-48

Price \$2350

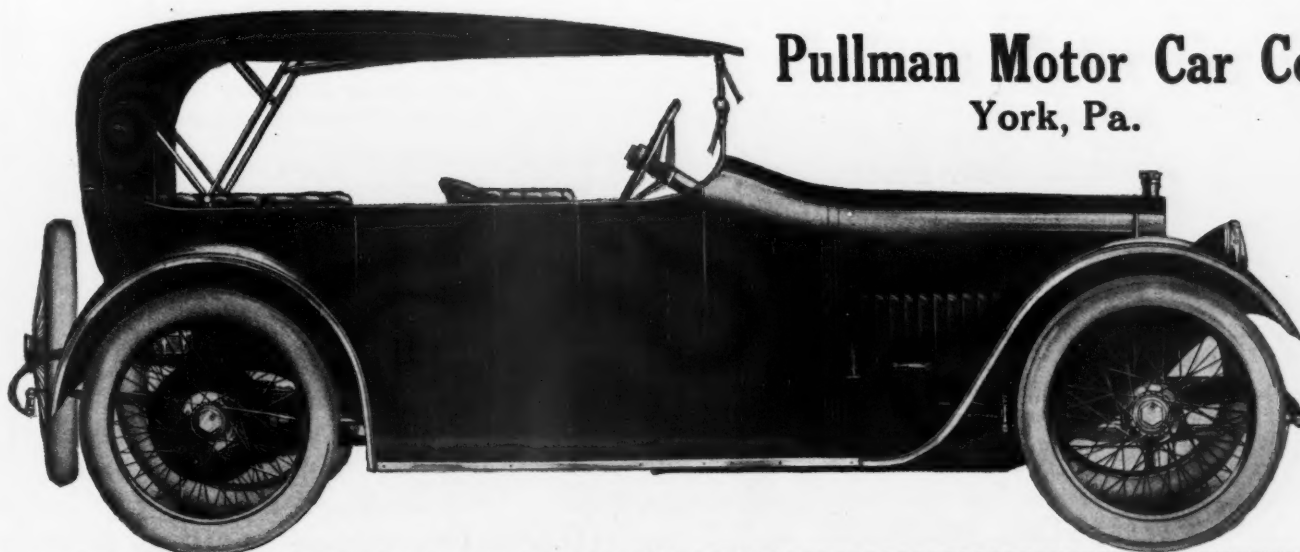
With Vulcan Electric Gear Shift

\$150 Extra

Seven Passenger \$100 Extra

The wheel base has been lengthened four inches, being now one hundred and thirty-four, the body is larger, having two inches more room in the driver's compartment and six inches in the tonneau, the seats have been raised and widened a bit, the rear doors moved back a trifle so that the tonneau may be easily entered, spring suspension has been strengthened just a little, the car has been lightened here and there, making it more flexible, the "Leatherette" Top replaces mohair, the dash-board has been covered with leather since it is more attractive and durable than polished wood, and a twelve volt electric system for starting, lighting and gear shifting has been used exclusively. The radiator, of a new type, combines lighter weight with greater cooling capacity, and yet the price remains the same, \$2350 (Vulcan Electric Gear Shift, extra charge, \$150).

Dealers, let us know at once how many cars you need for the coming year. We are in a position to fill your requirements.



Pullman Motor Car Co.
York, Pa.

The PUSH - THE - BUTTON CAR

When Writing to Advertisers, Please Mention Motor Age.

HUDSON Six-40

1915 Announcement

Why the HUDSON Six is the Biggest Selling Car

The season just closed on the HUDSON Six-40 left us 3000 unfilled orders. And the evidence is that the trend toward this car has only just begun. For the coming season we are trebling our output to meet the flood-like demand that's in sight.

This car proved the greatest of all HUDSON successes. There was nothing in its class to compare with it. And the new price and improvements for 1915 place it further than ever beyond competition.

Reasons for Popularity

The HUDSON Six-40, for the first time, brought a quality Six under \$2,000. Its price was \$1,750—a price below that of any comparable car, either a Four or a Six.

It came into a market which was hungry for Sixes. In the whole field above \$2,000 there was nothing in sight but Sixes. And tens of thousands of men had long been watching for a high-grade Six at a modest price.

The car itself was considered by most men the handsomest car of the year.

It was light, under-weighting other cars of its size and power by from 400 to 1,200 pounds.

It was most economical, consuming far less fuel than any equal-powered Four. And these were the features that men sought in a car.

Now 31 New Features

Our engineering corps, headed by Howard E. Coffin, worked on this car for three years. And it proved to be mechanically perfect. A season of use in thousands of hands has pointed out no shortcomings.

So all our engineers—48 of them—devoted last year to refinement. Our 1915 model shows 31 distinct improvements. Each adds some beauty, some convenience, some comfort to the car.

And Now a New Price

But the greatest sensation of the coming season will be the new HUDSON Six-40 price. Our trebled output will immensely cut production cost. We are going to undersell any price ever quoted on a quality car equipped.

We shall give buyers at that price a high-grade Six, according with all HUDSON standards. It will be roomy and powerful, with two extra tonneau seats. It will be equipped and finished in the most attractive way. It will be such a car as no other factory could build at the HUDSON price.

Right Dealers Wanted

We want the right dealer in every community where we haven't the right dealer now. We can offer that dealer the best opportunity existing in Motordom now.

Not many men will hereafter pay more than \$1,200 for Fours. Above that price the Six is the wanted type. And the HUDSON Six-40, with its price and its quality, is bound to be always the great seller in Sixes.

From now on it will be the best-advertised car in America. Every possible buyer in city and country will be constantly told of this car. We wish to hear from dealers who may want and deserve this matchless opportunity.

**Hudson Motor Car Company, 7897 Jefferson Ave.
Detroit, Michigan**



startzer!

starter

(not electric)

"The Starter that Starts Her"

PATENTS PENDING

FITS ANY CAR, INCLUDING YOURS

Installed in a Few Hours

SPECIAL ONE FOR FORDS

After five years of experiment and two years of test in actual use we offer you what you want, a starter that **startzer!**

It is not a complicated "system," not a contraption for letting you do your cranking sitting down. It is just a starter—that **startzer!**

Designed by a real engineer, it is splendidly built, self-contained, compact, automatic, simple, strong. It is hardly known to get out of order even when abused. And when needful, it primes the cylinders with acetylene or gasoline, as you prefer. A **startzer!** year has twelve months.

The **startzer!** is taking the country by storm because it does the business—and does it without any fuss, "try-it-agains" or "hope-so's."

ALL YOU DO IS PUSH THE PEDAL

The **startzer!** power is that of a coiled, flat spring, which is rewound and locked by the engine. Its simple perfection results from our recognizing the importance of the interesting little fact that a *spring has two ends.*

Let us explain: that is, SEND FOR OUR INTERESTING ILLUSTRATED BOOKLET and let it explain—you will be glad!

Prices: For a Ford, \$75.00. For any other car, \$85.00

*(Check with order guarantees immediate shipment. You take no chances on the **startzer!** first because there aren't any; second, because you may have your money back after thirty days trial "if you are willing to give up the **startzer!**")*

Good dealers may still get good territory if they apply with reasonable promptness—that is TODAY. Ours is a profitable line; for no customer can sleep till he has sold a **startzer!** to his friends and neighbors.

AUTOMATIC DEVICES COMPANY

503 Kellogg Street, GALESBURG, ILLINOIS

Jeffery Type of Motor Wins at Indianapolis



European cars with their small, high speed motors swept the card Decoration Day.

Jeffery cars with their European type, high speed, high efficiency motors have swept the American market this season.

Jeffery heard the demand for economy, quality, style and comfort in a moderate priced car a year ago.

American engineering practice did not afford a solution of the problem.

Economical cars could be bought, but they lacked beauty, style and comfort.

Big, comfortable, stylish cars could be bought, but they were expensive, required big, cumbersome motors and literally ate up gasoline, oil and tires.

Jeffery sent his engineers to Europe. They found the problem had been solved and the solution proven for two years.

It was the high speed, high efficiency, light motor. It made possible a light, yet sturdy chassis. It spelled economy.

That's the type of motor Jeffery introduced into the American market last fall in the Jeffery Four.

That's the type of motor that won at Indianapolis.

That's the type of motor the engineers and technical men have been talking about in almost every issue of the trade journals.

That's the type of motor that has turned all eyes on Jeffery success this season.

It's Economy Year and Jeffery Made It So

FOUR

5 Pass. Touring	\$1550
2 Pass. Roadster	1550
2 Pass. All weather	1950
4 Pass. Sedan	2350
5 Pass. Limousine	3000

SIX

5 Pass. Touring	\$2250
2 Pass. Roadster	2250
6 Pass. Touring	2300
5 Pass. Sedan	3250
5 Pass. Limousine	3700



\$1550

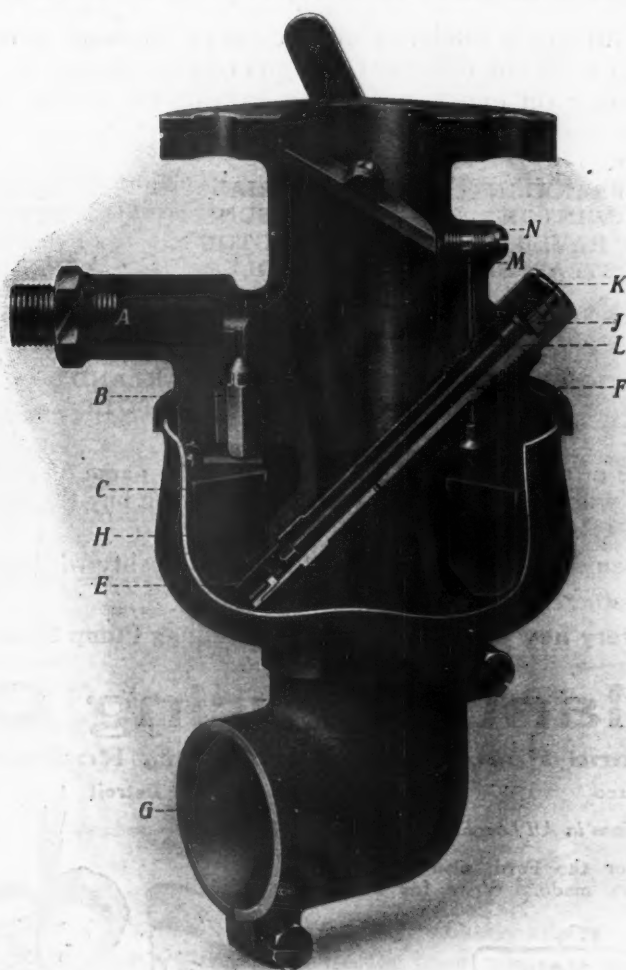
The Thomas B. Jeffery Company
Main Office and Works, Kenosha, Wisconsin

When Writing to Advertisers, Please Mention Motor Age.

THE PALLAS CARBURETOR

Surpasses all others in
Economy -- Simplicity -- Reliability

Victor in the
International
Carburetor
Competition of
the Royal
Prussian War
Department

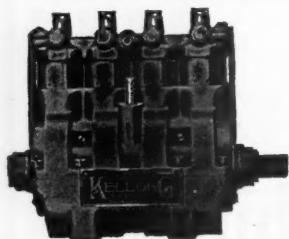


Adopted by
the Leading
Automobile
Manufacturers
of the
Continent

PALLAS-VERGASER GESELLSCHAFT
CHARLOTTENBURG 4, GERMANY

To Insure Tire Satisfaction

or at least to insure getting the best possible adjustment from your tire people, install the Kellogg Air Pump. Anyone who drives a car equipped with the Kellogg finds it easy to keep air pressure up to requirements. You can always rely upon the Kellogg pump because it is furnished with special attachments that fit **your** car. That is why over 49,000 Kellogg pumps have been placed on different makes of cars during the past five years.



Engine Driven KELLOGG Air Pump

One, Two, Four, Six Cylinder Models

With Attachments and Instructions, Ready to Install

You do not have to have misfit gears made. For five years we have been designing special attachments to go with the different designs of our pumps so that they would give maximum efficiency on every car. You cannot go wrong in buying the pump that is standard or special equipment for these cars:

PACKARD
PEERLESS
STEVENS-DURYEA
LOZIER

FRANKLIN
WINTON
HAVERS
STEARNS

IMPERIAL
JACKSON
LEXINGTON
CHANDLER

HOWARD
MITCHELL
FIAT
SPEEDWELL

2-Cylinder Pump
with attachments
for Buick "25,"
"26" and "37";
Mitchell 4s and
6s; Overland
"59," "69,"
"79"; Reo the
Fifth; Stutz 4s
and 6s.

and made with special attachments that any dealer can install on the

CHALMERS 1914
HUDSON
MAXWELL 6

STUDEBAKER SIX
BUICK
SIMPLEX
HENDERSON

OVERLAND
OAKLAND
ABBOTT

CADILLAC
REO
STUTZ
COLE

Send us the name and model of your car and we will give you the name of a distributor or dealer who can supply you and tell you what it will cost. Ask the dealer of whom you buy the car to be sure that the Kellogg is on your new model.

DEALERS: Send us the names of some of the people in your locality who own the above named cars and let us send them literature.

Every old car and every new car ought to have a Kellogg Pump to save tire expense

Kellogg Manufacturing Company

Main Office and Factory, 114 Circle St., Rochester, N. Y.

New York

San Francisco

Chicago

Detroit

Distributing and Service Stations in All Localities. Catalog on Request.

We also make an air-starter unit for the Ford; also larger air-starting units for practically all cars made. Write for catalog.



Worlds Record in Economy by Saxon Cars



34.53 miles average per gallon of gasoline.

Less than half a cent a mile for fuel.

Less than one-fourth cent per mile per passenger.

Best record 47.05 miles per gallon.



These are a few records of Saxon cars in 200-mile nation-wide non-stop runs made on the same day in more than 100 cities.

This contest was not a "stunt" affair on a single gallon of high-grade gasoline, but an impressive common-sense test. In one day at each city a Saxon car made 200 miles in **non-stop** running. The motor had to run whether the car was making mileage or not—during all stops, no matter for what cause. All records were vouched for by newspaper men who acted as official observers.

200 Miles Without Motor Stopping

Think what these records mean—not only in economy but reliability as well. Over 100 Saxons in more than 100 different places covered 200 miles each in non-stop running under official ob-

servation—in all kinds of weather, over all kinds of roads, up all kinds of hills—setting a world's record in economy, averaging 34.53 miles per gallon of gasoline, making perfect scores and showing speed as high as 45 miles per hour.

Most Economical of All to Run

In one day the Saxon proved to the whole nation that it is the most economical car of all to run—and that it can stand up and keep running under the severest service.

More evidence of Saxon reliability is being supplied by the "135-mile-a-day" Saxon. This Saxon, after traveling 135 miles a day for 30 days, **equivalent to a year's average service**, is now crossing the Lincoln Highway—from New York to San Francisco.

To Dealers—Although dealers' territory is nearly all allotted, yours may still be open. Write or wire for information and literature

Saxon Motor Company, Detroit

Address Dept. M

The Self Cooling Feature



WITH the approach of hot weather and the consequent greater danger of tire killing effects from overheating by road friction, comes forward another extraordinary quality of

PENNSYLVANIA *Oilproof* VACUUM CUP TIRES

*Racing men have discovered the remarkable heat shedding powers of these tires. Instead of becoming stored up in the tire, the heat radiates completely from the greater surface area of the Vacuum Cups and is thrown off as it generates, the tire never being in danger of weakening.

*FOR DEALERS—This is a point that should not be overlooked in properly advising customers in the selection of tires.

V. C.'s are guaranteed not to skid on wet or greasy pavements; guaranteed oilproof; guaranteed 4,500 miles, with average service records nearer double.

Pennsylvania Rubber Co. Jeannette, Pa.

New York
Chicago
Cleveland
Boston
Pittsburgh

San Francisco
Seattle
Los Angeles
Detroit
St. Paul

Dallas
Minneapolis
Omaha
Kansas City, Mo.
Atlanta

An Independent Company with an independent selling policy

WESTERN UNION TELEGRAM

THEO. N. VAIL, PRESIDENT

RECEIVED AT the WESTERN UNION BUILDING, 195 Broadway, N. Y.

Always
Open

Indianapolis, Ind., May 30, 1914

To Editor Motor Age--

Wish to thank your paper for Congratulations on our great Indianapolis victory. The Maxwell 25 represented the only popular priced American car to finish and win a place in this great gruelling contest, in which all world's records were broken. The Maxwell 25 exceeded in endurance and speed six foreign cars and sixteen American cars. With more power for its weight than any other car in the world, the Maxwell 25 is upholding American engineering supremacy in every event in every corner of the civilized world.

WALTER E. FLANDERS,

President Maxwell Motor Co.

HIGH *and* LOW TENSION MAGNETOS



MASTER VIBRATORS ROAD SMOOTHERS AUTO LOCKS

Smooth Riding on Rough Roads



That enviable pleasure of comfortable motoring—regardless of how rough the roads, or how fast you drive—is yours, made possible by



Road Smoothers

Reg. U. S. Pat. Office

Quickly Applied to Your Ford Car

They take the roughness out of the road and eliminate the pitching, swaying and vibration that racks and shortens the life of your car. K-W Road Smoothers seem to level off the high places and fill up the low places. Wherever you ride the bumps and jolts are gone—ironed out by the K-W Road Smoothers. They give you big, heavy car comfort, combined with light-weight car advantages. They save tire and gasoline bills and add greatly to your safety and the life of your car.

The "anti-rebound air chamber" prevents the rebound of the spring. It is an essential feature and found **only** in the K-W Road Smoothers.

The "anti-side-motion links" of the K-W Road Smoothers prevent side rocking and swaying when turning corners, and greatly reduce any tendency to skid.

There are no wearing parts or friction surfaces, consequently no oiling or packing in grease is necessary. No attention required after installation.

K-W Quality Throughout

K-W Road Smoothers are built of the very best materials obtainable. We use no cheap castings, but instead, high-grade, heat-treated drop forgings. Our springs are made of electric smelted chrome, Vanadium steel—the most expensive spring steel that money will buy. They will not bend—they will not break—they will not lose their easy riding qualities because K-W quality is built into them all the way through.

\$25 Set of Four
One For Each Wheel

The principle is right—the design is right—the workmanship is right—and the price is right.

K-W Road Smoothers are sold by reliable dealers everywhere. If your dealer cannot supply you, we will send a set direct to you on receipt of price. Don't confuse these with ordinary shock absorbers. Write for free booklet—"Taking out the Bumps." We will gladly send it on request.

HEADLIGHTING OUTFITS

THE **K-W** IGNITION CO.
2835 CHESTER AVE. CLEVELAND, OHIO, U.S.A.

SPARK COILS SPARK PLUGS



The Tube for Tropical Tests

WHEN you experience the wonderful heat-resistance of Firestone Red Inner Tubes, you might think them made of asbestos.

When time and wear prove their endurance, you might wonder if they are not of steel.

But when you realize the resiliency, their "life" and "go" and "come-back," you know they are made of Firestone rubber.

Because only Firestone rubber is equal to Firestone perform-

ance. It alone has tensile strength, density and heat-resistance which serves best in all weathers, through all kinds of driving—for the longest time.

The unhurried, painstaking Firestone method of building removes the possibility of air bubbles or grit, insures impervious texture and uniform thickness, prevents deterioration and stretching.

All sizes—made to exact size—at your dealer's.

Most Miles per Dollar

Firestone Tire & Rubber Co, Akron, O.—Branches and Dealers Everywhere

"America's Largest Exclusive Tire and Rim Makers"

Pneumatic Tires, Truck Tires, Pleasure Electric Tires, Carriage Tires, Cycle Tires, Fire Apparatus Tires, Rims, Tire Accessories, etc.

Firestone

RED INNER TUBES

When Writing to Advertisers, Please Mention Motor Age.

The Jiffy Roll of Honor

includes thirty-two names. It is a list of automobile makers who supply their customers with the safest, neatest, handiest and most efficient top curtains—the biggest **value** despite the fact that they represent higher cost.

There is but one “best” and the obvious supremacy of “Jiffy” curtains is maintained by nothing more or less than **exclusive practical merit**. Clean-cut superiority is the potent reason why the car-informed public recognize and accept “Jiffy” curtains as “the best.”

Abbott-Detroit
Chandler-Six
Franklin
Hupmobile
Howard-Six
Hudson
Keeton

Knox
Krit
Lewis
Lexington
Locomobile
Lozier
Luverne

Maxwell
Mitchell
Monarch
Oakland
Oldsmobile
Palmer-Singer
Packard

Paige
Peerless
Pierce-Arrow
Pilot
Regal
Studebaker
Speedwell
Stevens-Duryea
White
Winton
Willys-Knight

Invisible Cable

An Important Improvement

By means of a simple device the cable on which “Jiffy” curtains slide into service is now made invisible when curtains are not in use. This allows perfect freedom when putting up or taking down the top and at the same time keeps the cable available for instant use. A practical refinement that works equally well with regular style and “One-Man” tops. Get the details.

“Jiffyquipt” means

Top curtains that:

Can be raised or lowered in 60 seconds.

Slide back and forth on black japanned cable—a little push and curtains in position—a little pull and curtains out of sight.

Are best for **safety**—give full view from inside.

Give **more** light.

Don't get lost or misplaced—always on the job.

Are out of the way when out of use.

Have celluloid lights that don't crack because folded flat.

All summed up it means the best looking and most efficient top curtain equipment.

This License Tag, showing number or name of Licensee, is required to be affixed to each set of “Jiffy” curtains manufactured.



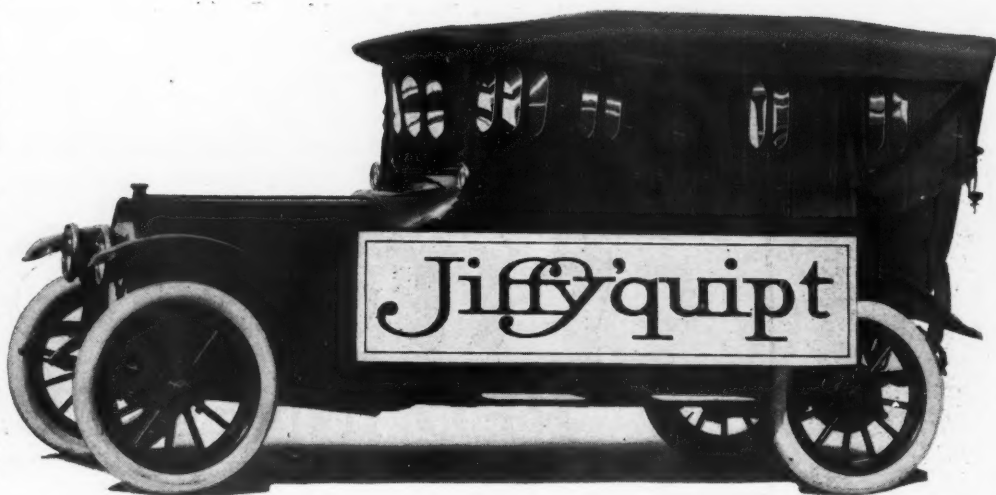
It insures the genuine article and affords legal protection to purchasers. Look for it on right rear curtain.

INFRINGEMENTS WILL BE VIGOROUSLY PROSECUTED

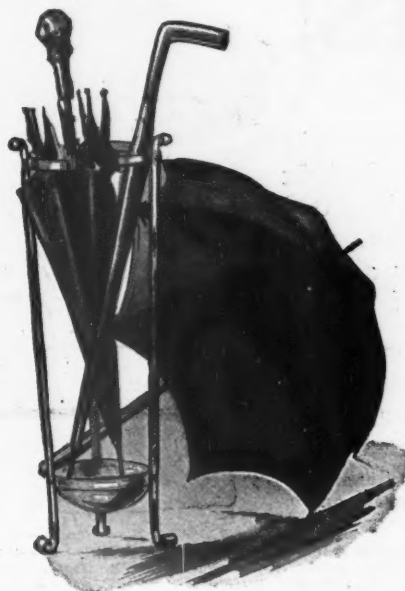
Is it any wonder that top makers everywhere are replacing “old style” curtains with Jiffy curtains? That 33 makers express their fixed preference for the best by supplying them?

Jiffy Auto Curtain Co.

Detroit, Mich.



When Writing to Advertisers, Please Mention Motor Age.



Who Ever Heard of a Rubber Umbrella?

THE functions of an umbrella and an automobile top are almost identical. The purpose of each is the same, yet there is no such thing as a rubber umbrella. Is there any **good** reason why there should be rubber in an automobile top cloth, except as mentioned in our previous announcements that such cloths have been make-shifts pending the advent of a perfect automobile top cloth.

An umbrella is made of one piece, single thickness cloth, free from all chemical compositions, yet it affords complete protection.

Laidlaw Burbank Motor Cloth is one solid piece of cloth free from rubber or artificial leather compounds. There is nothing in Bur-

bank to dry out, crack, decompose, peel, blister or rub off. These weaknesses do and always will exist in rubber interlined or artificial leather surface-coated cloths.

An umbrella is an extremely practical article which opens conveniently and folds compactly, and a good one will give excellent service for years. All because there is nothing chemical about it to be affected by heat or cold or long continued folding.



Laidlaw Burbank Motor Cloth possesses every one of the features and characteristics of a perfect top material, and retains them under the most severe and trying conditions, for a period of time longer than the life of the car.

The Laidlaw Company, Inc.

126-132 West 46th Street

New York, N. Y.

Ford Owners!



Here's
an electric light
that's always right. 7000
candle power always in
front of your car all the
time regardless of engine
speed.

NEWOLITE
Electric Lighting for Ford Cars.

An Electric Lighting System That Generates
from Independent Dynamo. No Strain on
Magneto

A clear steady light at any speed or even when engine is standing still. Specially built for Ford, Velle, Metz, Flanders or any small car or cycle car. Storage battery never needs renewal. The first successful Ford electric lighting plant ever built. Complete equipment includes high grade dynamo; automatic cutout; 6 volt Willard storage battery; black enameled steel battery box; 2 8½ inch bullet head lights; tail lamp; 2 15 candlepower Mazda globes; 1 pair side lamp adapters; 1 switch, 1 fan and generator belt. All necessary wiring and screws.

The New Lite ends your gas trouble or the danger of driving in flickering glare of a varying magneto light. Henry Ford refuses responsibility for ignition trouble when magneto is used for lighting.

Fully Equipped---Guaranteed---ONLY \$40

Gives you lighting system equal to that on \$2000 cars. Sold at lowest price ever made. No risk, we guarantee it. Write for literature or ask Ford dealer.

New Lite Manufacturing Co.

2100 New Lite Bldg.

NEWTON, IOWA



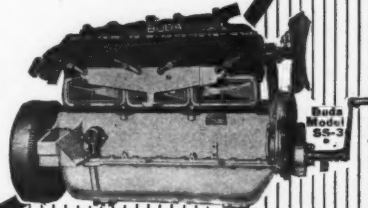
BUDA MOTOR

The Part That Sells The Car

As the Automobile becomes an "old story" the buyers' knowledge of its mechanism increases. Today the average buyer of a motor vehicle is more or less an expert. He may be particular about the body and trimmings, but he also insists on being shown the "works." It is partly because of this, and partly because manufacturers are gladly recognizing proven merit, that the demand for the BUDA MOTOR grows and grows and grows and grows.

The Unequalled Buda Six

is being adopted by the manufacturers of some famous fours who are now adding the six to their lines, because The Buda Six, Models "SS-3" and "SS-U" have *no superiors* in the whole automobile field, no matter what the price. Both scientific and practical tests will prove this for any interested manufacturer.



THE BUDA COMPANY

FACTORY, HARVEY, ILL., (Chicago Suburb) Address
BRANDENBURG & COMPANY, 1108 S. MICHIGAN AVENUE, CHICAGO
5th and Broadway, New York Ford Building, Detroit

When Writing to Advertisers, Please Mention Motor Age.

Prest-O-Lite

**The Sure
Cure for
Lighting
Troubles**



**"I've quit
worrying
about light!"**

"One season was enough for me!

"I tried electricity. I stood for 'expert service' and repair bills and battery and parts renewals. I've kicked and fumed and sweated long enough.

"Now I have sure, safe, satisfactory, saving light! I've taken all the junk off and substituted

Prest-O-Lite"

This is the expression of hundreds of wise motorists. Our correspondence proves it.

You can have more satisfaction and service out of your car if you will eliminate the useless complications.

You can cut down weight—increase your power—eliminate a big percentage of trouble—if you are now attempting to use electricity for light.

For about the cost of one repair bill or battery renewal you can make the change from electricity to Prest-O-Lite.

About Convenience

The Prest-O-Lite, or any other good automatic gas lighter, offers you every "push-the-button" convenience for lighting, dimming or extinguishing your gas lights. The automatic reducing valve prevents the flame from exceeding the proper height.

No matter what self-starter is on your car, be sure your lights are gas lights. Reliable light is just as essential as fuel.

Use the Coupon

Get the real facts about satisfactory light today. Read the letters showing how other motorists have solved their lighting problems. Wake up to the new meaning of gas lighting with every comfort, convenience and economy. Your address brings it.

The Prest-O-Lite Co., Inc.

233 Speedway,

Indianapolis, Indiana

(Contributor to Lincoln Highway)

Exchange Agencies Everywhere

The
Prest-O-Lite
Co., Inc.

233 Speedway,
Indianapolis, Indiana

Send the real facts
on satisfactory light and
letters from owners to



The Tuthill Titanic is the Only Spring Guaranteed Unreservedly Against Center Breakage

There is just one spring that is guaranteed not to break at the center, where 75% of all springs do break—it is the Tuthill Titanic. Should it break at the center, which is a very remote possibility, we will replace it free, and pay all express charges on new spring. No other manufacturer makes this guarantee.

We guarantee every Tuthill Titanic not to break at the center, for it is made unbreakable. We eliminate the weakening center bolt.



Guaranteed Absolutely Against Center Breakage

Not only are Tuthill Titanic Springs guaranteed unreservedly against breakage at the center, but our regular guarantee which goes with every Tuthill Spring covers the rest of the spring.

Tuthill Special Repair Service

While the Tuthill Titanic is unbreakable we maintain a Service Department for motorists who use other springs. We are prepared to express, on a moment's notice, a spring for practically any model of any car. Wire or write—prompt service.

This Special Service will enable dealers to give their customers the prompt service they demand. And giving them a far better spring than the one that broke—The Tuthill Titanic—they build up a big replacement business. The price for a Tuthill Spring is lower than other springs for the same high quality—the repair man makes a larger profit—and the car owner gets a better spring.

The automobile spring that can be depended to give the motorist every possible comfort, not only in ordinary service, but under the most severe and trying conditions, is the Tuthill Titanic. No dread of spring breakage with a Tuthill Spring under your car. Write for price list.

TUTHILL SPRING CO.
762 Polk Street Chicago
1725



Tuthill Titans are guaranteed not to break at center



SPEED UP!

If your car "lags"—loiters on hills—stalls in the mud and sand—and takes the dust of cars with little over half its horsepower, your compression is poor and your piston rings are leaking. What you need to speed up is a complete set of—

McCadden Leak-Less PISTON RINGS

Take your car to your repairman. Tell him to equip it with McCADDEN Rings. If they don't give perfect compression, increase your power, decrease your fuel bills and lessen carbonization—send them back to us and we will refund their full purchase price.

SATISFACTION GUARANTEED OR MONEY REFUNDED

Take pride in your car's power! Write for prices and descriptive literature today.

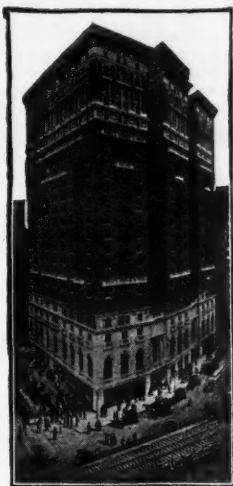
McCadden Rings are Flexible—Self-Adjusting

Note the perfect joint. Gas cannot escape past the lap; it cannot go under because of the inner ring. McCADDEN Piston Rings hug the cylinder—conform to its contour. No matter how much the cylinder may wear the leakless joint of the McCADDEN Ring is not affected. The McCADDEN Ring is a concentric 2-piece ring made of specially processed gray iron. The inner or expanding ring presses the face of the outer ring flush against the cylinder wall. The McCADDEN Ring reduces tremendously the friction caused by old style rings, thereby making for greater speed and less cylinder wear. McCADDEN Rings are pinned in such a fashion that the pin is concealed and cannot possibly work out. These rings can be quickly attached by any one by simply snapping them over the piston with thumb and finger. U. S. and foreign patents applied for.

Full Descriptive Literature on Request

DEALERS AND JOBBERS: Here is a guaranteed quality ring at a reasonable price. Write for generous sales proposition.

McCadden Machine Works
St. Cloud, Minnesota



The McAlpin Makes Your Stay in New York a Real Event

WHETHER your stay in New York be brief or protracted the Hotel McAlpin will make it memorable.

In the very heart of the theatre and shopping districts at Broadway and 34th Street—within one block of the Pennsylvania Terminal and a short walk from the Grand Central Station—with transportation to every point at its doors—and with a patronage of rare distinction, the McAlpin naturally appeals to everyone who appreciates the luxuries of metropolitan life.

Charges are so moderate as to be notable. Although the McAlpin is the largest and safest hotel in the world—with cuisine that cannot be excelled and exceptional service—yet your enjoyment of its conveniences is never marred by excessive rates. And here at the McAlpin is that happy combination—home-like comfort amid surroundings that are at once brilliant and in marked good taste.

Make it a point to stay at the McAlpin. The people you meet and the perfection of the appointments will make your visit a distinct event.

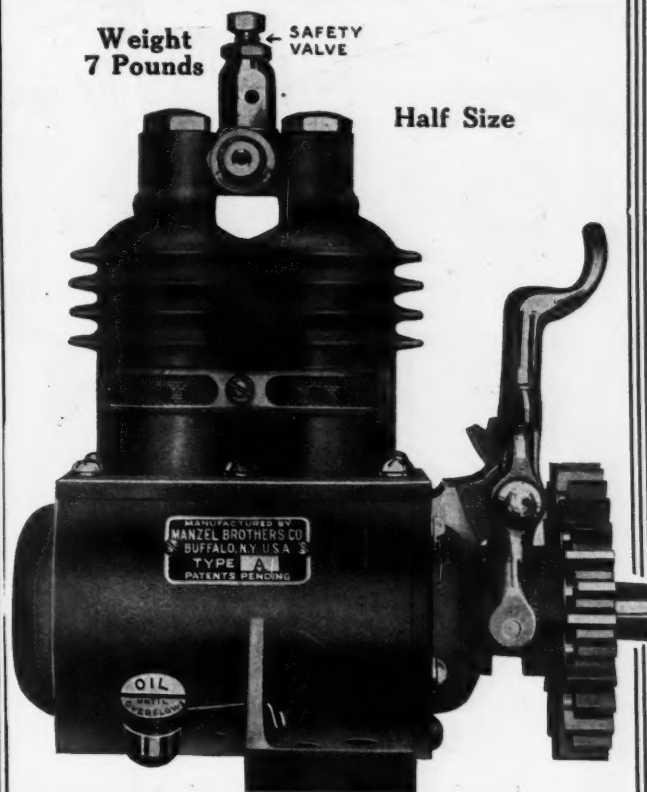
Management of MERRY & BOOMER

HOTEL McALPIN

Herald Square

NEW YORK

Nearer than Anything to Everything



The Manzel Engine Driven Tire Pump

Puts the "sure" in pleasure—by taking away the only unpleasant feature of driving—that of pumping tires.

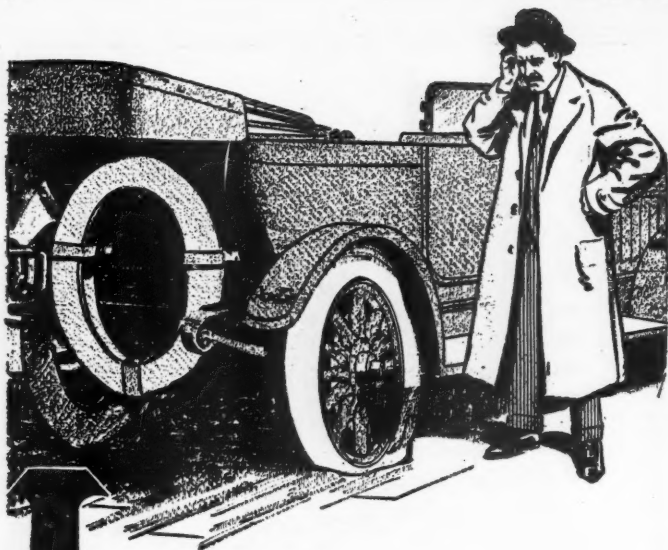
Utilizing the power of your motor, THE MANZEL drives a steady stream of fresh air into your tires while you sit by and watch it.

MANZEL

ENGINE DRIVEN TIRE PUMP

The installation of a MANZEL ENGINE DRIVEN TIRE PUMP on your car is a simple matter. We carry fittings in stock that make the MANZEL ready for immediate attachment to Abbott-Detroit, Buick, Cadillac, Cole, Cartecar, Chalmers, Hudson, Howard, KisselKar, Maxwell, Mitchell, Oakland, Overland, Packard, Paige-Detroit, Reo, Speedwell, Studebaker, Stutz and other cars.

MANZEL BROS. COMPANY
306 Babcock Street BUFFALO, N. Y.



Is this your customer?

What does he think of *you* now?

Has his good opinion of you fallen as flat as his tire after the puncture?

You can protect your customers from punctures. And in doing this you can make your own good reputation puncture-proof.

Lee PUNCTURE-PROOF OR MONEY BACK Pneumatic Tires

are "the tires that put the *sure* in pleasure"; the only pneumatic tires that are sure to give your customers uninterrupted service.

Back of every Lee Puncture-Proof Pneumatic Tire is an absolute guarantee—

"Puncture-Proof or Money Back"

It is a guarantee that convinces the customer—that makes selling easier.

Why waste time and effort on tire lines that are as much alike as peas in a pod? Get full data now on the different line that meets every demand.

Dealers' Proposition "U" and full details of construction are yours for the asking.

LEE TIRE & RUBBER CO.
CONSHOHOCKEN, PA.

KELLY-FIELD CO.
General Sales Agents
1737 Broadway
New York City



Note the construction

Not a troublesome outside cover—not an inner case. A regular pneumatic tire of finest

"Vanadium" Rubber with 3200 steel discs imbedded within the tread, in overlapping layers with fabric between to prevent friction or heating. No nail can enter.

Gould Storage Battery

A recent Cleveland customer wrote to our local branch manager:—

"I consider the Gould Battery by far the best both as to mileage and durability.

"One of the big advantages in purchasing a Gould Battery is the splendid attention given by your service station. I always found you solicitous as to frequent inspections.

"Prior to purchasing the 32-cell Gould Battery for my car last October, I owned three others. To my knowledge, representatives of those batteries at no time made inquiry as to their welfare.

"The attention you give patrons is especially valuable, inasmuch as the average electric vehicle owner knows little about care of batteries."

Our unvarying instructions to representatives are to help all Gould Battery users with good attention and good advice on how to keep their batteries free of faults. We wish to make strong satisfaction stronger—we stay close to customers so they will stay close to us.

We can and will give every assurance of splendid service, high mileage per charge and long battery life.

Gould Renewals fit jars of any make.

Ask for booklet, "What Gould Vehicle Batteries Are Doing."

Gould Storage Battery Co.

General Offices: 30 E. 42d St.,
New York City

Works:
Depew, New York

Boston—14-16 Cambria St.
Philadelphia—613 Betz Bldg.
Cleveland—1761-5 E. 18th St.
Detroit—88 E. Congress St.

Chicago—The Rookery
San Francisco—1440 Van Ness Ave.
Los Angeles—110 E. Pico St.

Agents in
Washington, Rochester, Buffalo, Pittsburgh, Milwaukee, Minneapolis, St. Louis, Kansas City, Omaha, Denver, Topeka, Seattle

CANADIAN REPRESENTATIVE:
R. E. T. Pringle, Toronto, Montreal, Winnipeg, Vancouver

Full stock of parts, plates and repairs carried by all offices and agents.

104

MAKE \$250.00 A MONTH
Repairing AUTO MOBILE Tires

Sounds like a lot of money
 —IT IS—A WHOLE
 LOT of MONEY to be earning
 CLEAR every month—yet it's
 what hundreds of men we have estab-
 lished in the Automobile Tire Repair
 Business are making. You let down the
 DRAW BRIDGE for SUCCESS to enter into
 your career by getting into business for your-
 self. The business for you is the one where in-
 vestment is small—the returns quick and for
 cash—where the margin of profit is large—the de-
 mand for your PRODUCT or SERVICE constant
 and ever on the increase.

A HAYWOOD TIRE REPAIR EQUIPMENT

answers to all of these requirements of Old Dame Fortune—The certainty of success in this business is as sure as anything in this world can be—Each year adds thousands of new Automobile Owners—they need YOU to keep their tires in service.

Here Is Your Opportunity!

Be first to enter this new big paying business in your town. Open your pockets. Let the dollars pour in. Act quick. Every auto sold means more tires to mend. Automobile business is growing fast—enormous field for tire repairing. Punctures and blowouts are common. Tires need retreading and vulcanizing. Something going wrong all the time. Thousands forced to buy new tires because they can't get old ones fixed. Think of the old bicycle days—repair shops on every corner—all making money—busy day and night. Autos make same proposition over again—only ten times bigger and better. Users of Haywood Tire Repair Plants are making big money. Johnson, Tex., writes: "I have made as high as \$18 in a day." Another man who bought a plant September, 1911, writes he has cleared over \$3000.00. That's going some! Operate a plant as side line in connection with auto business—garage or as an independent business. Find neighborhood where there's a bunch of autos—get all the steady business besides transient work. Experience unnecessary. You learn quick. Simply follow directions—practice a few days on a couple of old tires and you'll be ready to coin money. Business comes fast and easy.

Repair Tires At Home

Young men! and boys re-
 pair father's tires—get
 money he pays garage
 man. Get the neighbor's
 work. Make money to at-
 tend college or to start a
 garage and repair busi-
 ness.

Auto Owners—Repair
 your own tires—save money—pay
 for your outfit in short time. We
 have outfits for home use. Any-
 how, investigate. Send today for
 catalogue. See the wonderful pos-
 sibilities in this marvelous
 field. Learn of the enormous
 money-making opportunities in
 this fascinating new business.

Haywood Tire & Equipment Co.
 720 N. Capital Ave., Indianapolis, Ind.

The New Money-Making Business
 —Start Now—This Man Is Making
 Money

Business Keeps
 Coming



Put
 Yourself
 Where
 This
 Man Is



Hiram Percy Maxim Has Silenced the Noise of the Ford Motor

He has invented a simple, low-priced device which silences the exhaust noise as effectively as his wonderful Maxim Gun Silencer silences the noise of rifles or the Maxim Boat Silencer stops the racket of motor boats.

THE MAXIM SILENCER FOR FORD CARS

Not only ends the annoying "chug-chug" of the exhaust, but greatly reduces the back-pressure and makes the car more economical of gasoline, more efficient, quicker-starting, and a better hill climber.

PRICE ONLY \$6.00

Anyone can attach it quickly and easily. It replaces the regular muffler. Makes the Ford as quiet-running as the highest priced cars.

If your dealer hasn't it, we'll fill your order direct.

DEALERS: Write for prices if your jobber cannot supply you. Get your order in early, as the demand is big. A big advertising campaign starts soon.

Write for Descriptive Folder.

The Maxim Silencer Co.
 6 Colt's Armory HARTFORD, CONN.

NEW DEPARTURE BALL BEARINGS

"Quality First Means Safety Always"

The high quality of every New Departure bearing is guaranteed. Back of that guarantee are a multitude of tests to safeguard it. Every item of material must reach scientifically determined standards and be subjected to the approval of our chemists, metallurgists, physicists and engineers.

The accuracy of finish of every individual unit (including the balls) must pass the most rigid inspection. Not once, but after each operation. Not by one inspector, but by one hundred and five.

And the finished product must withstand tests five times as severe as will ever be applied in actual use under a car.

Engineers, expert in dealing with the ball bearing problem, will gladly advise with you regarding bearing size and mounting best adapted to your proposition. This service is free and will certainly save you time and probably money. When writing, give maximum and minimum speeds.

THE NEW DEPARTURE MFG. COMPANY

BRISTOL, CONN.

Western Branch, 1016-17 Ford Bldg., Detroit, Mich.

Purchasing an

UNDERWOOD Typewriter

means

A satisfied operator.

Distinctive Work.

A pleased employer.

And a short day.

Speed, Accuracy, Stability

Exclusive features, proved by winning every International Contest, stamp the UNDERWOOD as supreme.

UNDERWOOD

"The Machine You Will Eventually Buy"

When Writing to Advertisers, Please Mention Motor Age.

WANTED—District Salesmen and Efficiency Engineers

Being specialists in hauling equipment and haulage problems the advantages of a trailer for use with Motor Trucks was realized by us long ago.

Three years ago we took the proposition up seriously and since that time have been experimenting with and developing a Motor Truck Trailer. We have proven its adaptability and practicability—the economical feature is appreciated at first thought.

The name TROY on the Trailer is sufficient guarantee as to quality and construction.

We have been ultra-conservative up to this point attempting to avoid the many errors that naturally creep into a new proposition and we are going to proceed just as cautiously in the marketing of the Trailer.



We are now organizing our field forces and for this work we want **District Salesmen and Efficiency Engineers.** Efficiency engineers will be used to gather data from present owners and possible users of Motor Trucks, to make suggestions to owners that will increase the efficiency of Motor Trucks, primarily by use of Truck Trailers where their use is found practical and an increased efficiency factor. We want, for the work, young college bred engineers, either civil or mechanical, preferably civil, with clear records and good sense, competent to figure costs, grades, etc., with initiative to be able to suggest improvements on equipment to owners. These Efficiency Engineers will not be expected or allowed to make sales, but will be eligible to promotion into the Sales Department as their merits develop.

DISTRICT SALESMEN We want high class men with actual satisfactory sales records competent to take the data found by the Efficiency Engineers and promptly close the sale where TROY Trailers are shown to be a satisfactory efficiency factor. Fixed salaries will be paid in both instances and will be based on efficiency only. Applications should be accompanied by photo and a complete statement of experience and qualifications and at least four responsible references. Applicants will be promptly furnished full data regarding our products pending our inquiries into their merits.

The Troy Wagon Works Company, Troy, Miami County, Ohio

I Multiply Your Business

—E. Z. Rider

Mr. Dealer, I want to come and work for you!! I multiply sales, and if you'll give me a chance I'll bring you business—**big business.**

Just as soon as I get onto a Ford I begin to talk—and I keep on talking. I make the Ford ride so easy that the owner becomes enthusiastic at once. And he begins to talk E. Z. Rider Shock Absorbers to other Ford owners. That's the way I multiply business for the Dealer. One set in use sells another—and another—and many others.

E. Z. Rider Self-Adjusting Ball and Socket Joint \$15 Set of Four

This is a special and exclusive feature of E. Z. Rider Shock Absorbers. The Ball and Socket Joint gives free and easy action of the springs.

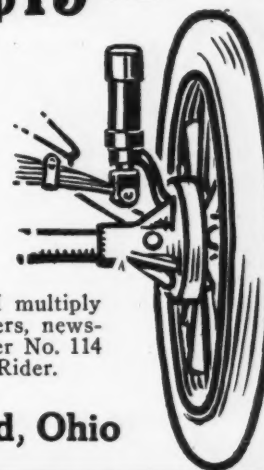
It insures a straight pull at all times and prevents binding. This special feature with the high quality makes E. Z. Rider the **Superior Shock Absorber.** E. Z. holds the springs in exactly the same position as Ford Spring Brackets.

Sales Helps for Dealers

Dealers, send in your order today and let me show you how I multiply business. Special sales helps free—outdoor signs, advertising folders, newspaper advertisements, cuts and moving picture slides. Ask for Folder No. 114 and special dealers' proposition.

— E. Z. Rider.

The Forest City Electric Co., 5014 Windsor Ave., Cleveland, Ohio



Every Feature You Need —All Standard—and the Price Only \$1195

Study the Glide "30" as you would a piece of merchandise. Consider the market value of every feature in its make-up—compare it to the finest detail with the cars selling at double its price. Furthermore, the Glide "30" is backed by a strong guarantee for one full year. And this guarantee is further backed by a strong, conservatively managed concern whose sales have increased every year since it was organized in 1882.

Here's the car that's really every man's car. You could not ask for better in **power, endurance, comfort and appearance.** Write us for catalogs.

Dealers: Write us for our agency proposition. It's a profit maker.

The Glide "36," \$1840 The "Thoroughbred." More of them are being sold every day to shrewd buyers who know automobile value when they see it

The Bartholomew Co. 215 Glide Street. Peoria, Ills.



The New Model "30"

Glide

Model "30"

**Double the Price Could
Not Beat This
Equipment**

- Electric Starter
- Electric Lights Throughout
- Unit Power Plant
- Long Stroke Motor, with four cylinders en bloc
- Center Control
- Left Side Drive
- Motor Driven Tire Pump
- Floating Rear Axle, with pressed steel housing
- Demountable Rims, with one spare rim
- Windshield
- Stewart Speedometer
- Tire Irons on rear for extra tire
- Jack, Tool Kit, Tire Repair and Flash Lamp

Operating between
Detroit and
Buffalo

"Two GIANTS of the Great Lakes"

Str. City of Detroit III
Str. City of Cleveland III



The Delights of a Lake Trip

REST after work is necessary to human endurance, and holidays are a wise economy. The Great Lakes of America offer more vacation opportunities than any other source in the country. The steamers of the Detroit and Cleveland Navigation Company operating to all important ports are unrivalled in point of elegance, comfort and quality of service—the perfect freedom offered by the saloon and promenade decks, the commodious state rooms, luxurious furnishings and excellence of cuisine make life aboard these floating palaces a solace to the weary mind and body.

Where You Can Go

Daily service is operated between Detroit and Buffalo, Detroit and Cleveland; four trips weekly between Toledo, Detroit and Mackinac Island, the historic summer resort of the North Country; and from June 25 to Sept. 10 a special steamer, two trips weekly, will be in commission between Cleveland and Mackinac Island, stopping only at Detroit every trip. During July and August special daylight trips between Detroit and Cleveland. From June 10 to Sept. 10—daily service between Toledo and Put-In-Bay.

Railroad Tickets Available

Tickets reading via any rail line between Detroit and Buffalo, Detroit and Cleveland will be honored for transportation on D. & C. Line Steamers in either direction. Send 2 cent stamp for illustrated pamphlet and Great Lakes Map. Address L. G. Lewis, G. P. A., Detroit, Mich.

DETROIT & CLEVELAND NAVIGATION CO.

Philip H. McMillan, Pres. A. A. Schantz, Vice-Pres. and Gen. Mgr.
General Offices, Detroit, Mich.
Steamers arrive and depart from Third Avenue Wharf, Detroit.

How's \$7 This For



PATENTED

**The Brown Jr. Tire Pump
Complete With 10 Feet of
Woven Air Hose Tested to
500 lbs. Pressure.**

If you own a Ford or any other small car, you can't afford to break your back pumping up the tires.

The Brown Jr. will do the work for you more quickly and better than you can do it by hand.

Made of the same materials and on the same mechanical principles as the Brown Impulse Tire Pump, which is making good for more than 60,000 automobilists. Don't forget the price, \$7.00; \$8.50 if you want a Brown Q. D. Spark Plug and connections.

Write us or ask your dealer concerning this latest sensation.

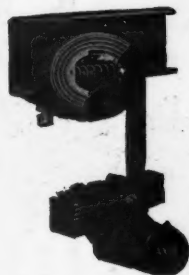
THE BROWN COMPANY
120 Bellevue Syracuse, N. Y.

Business Is Good with dealers who are pushing the sale of Gabriel Snubbers, because every set stays sold, makes new enthusiasts and opens the way for other sales.

Over 3 Times as Many Gabriel Snubbers are being sold this year as last, notwithstanding 1913 topped two years of rapidly increasing sales. This is because motorists are now demanding Easy Riding as well as protection to their cars against deterioration.

GABRIEL SNUBBERS

Will Help to Sell Your Cars
\$15, \$20, \$25 Per Set of Four. Half That Per Pair



Snubbers retard the upward movement of the springs, preventing abrupt or excessive rebound, the cause of jolts and jars to occupants and mechanism. They keep you on the seat instead of bouncing from it.

Compression of the car springs draws belting into the coil. The moment the springs commence to expand, the layers of belting tighten on the brass friction band within the coil. That friction is what retards upward movement of car body. When springs are at rest there is only enough "pull" on the belting to keep it taut.

Standard Factory Equipment

on the easiest-riding cars, White, Stearns, Peerless, Oldsmobile and Lozier. Partial or special equipment on over 20 other leaders.

On Small Cars

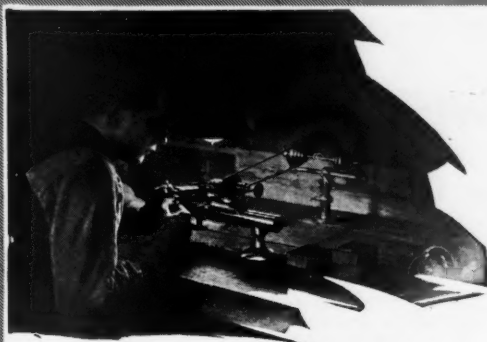
Snubbers are even more a necessity because of the abrupt rebound and jolts that go with short wheelbase.

Ask the Engineering Department

of your car about Snubbers. They have tested Snubbers and know their merits.

Gabriel Horn Mfg. Co., 1415 E. 40th St., Cleveland, Ohio

We also manufacture GABRIEL Musical Horns and Windshield Cleaners.



THE extreme simplicity of the Zenith with its absence of auxiliary valves and cams and springs is the natural ideal of carburetor design. It was made possible when Baverey invented the Compound Nozzle—the greatest step forward in carburetion since Krebs' early device. Our catalog will explain. Ask for it.

Accuracy to the Nth Degree

FEW people realize the fine work necessary in building the high grade Zenith carburetor. Delicate lathes, jewelers' lenses and skillful fingers all do their share. Especially is accuracy required in the float needle valve. Gasoline is extremely fluid. The smallest variation from a perfect seat will soon flood the float chamber—and the carburetor.

The fine work of turning perfect seats on these special alloy stems is accomplished on jewelers' lathes. Here the operator watches through his magnifying lense and with steady hand points each stem as close to accuracy as human ingenuity can devise. Zenith quality is only another name for accuracy.



ZENITH CARBURETOR CO. DETROIT, MICH.



SHIFT
THIS LEVER
FORGET THE
WEATHER

Many a dollar, and many a horsepower, has been lost between the fuel-tank and the drive-shaft simply because the carburetor wasn't a—

Motsinger
Carburetor increased mileage guaranteed

The MOTSINGER is what engineers call an "all-weather" carburetor. You can instantly adjust it so that every change in temperature, altitude or humidity may be taken advantage of.

You control your engine's power and economy the year through.

Try a Motsinger on Your Car or Truck.

Write for interesting literature describing how and why we can guarantee the MOTSINGER to pay for itself.

THE LEVER WEIGHS
OUT A JUST RIGHT
MIXTURE HERE



Motsinger Device Mfg. Co.

885 Putnam Street

LAFAYETTE, IND.

"WARNER GEARS—STANDARD FOR YEARS"

"It's an absolute impossibility to 'open up' a plant and immediately deliver efficient gear assemblies.

"It takes time and experience—especially experience—to enable a concern to ship really dependable parts.

"This is an undisputable fact, no matter what the business happens to be.

"We are surely capable, in lieu of these facts, as for thirteen years we have been manufacturing automobile gear parts for the most successful and best known motor car manufacturers in the country.

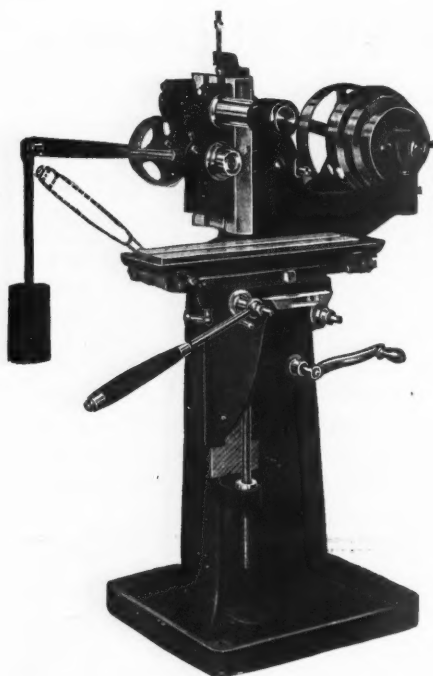
"And listen, what is more, we've been pleasing them in every particular.

"Is there any better proof of a product's merit than one hundred per cent of satisfied customers?

"Looks as if we ought to be able to please you too."

**WARNER
GEAR
CO.
MUNCIE-IND.**

DETROIT OFFICE—628 FORD B'L'D'G.



"Whitney" Hand and Weight (Feed) Milling Machine
For Cam Cutting, Gear Cutting, Key Seating, Profiling, Slabbing, Slotting, etc. This machine is the handiest, most adaptable and most efficient on the market.

THE WHITNEY MANUFACTURING COMPANY
HARTFORD, CONN.

Copy contributed by Gleeson Murphy of the H. K. McCann Company, Detroit, Mich.



For Our "100 Million" Nation

A growth of 7,000,000 in four years has placed the United States in a position where it "looms as the true colossus of the modern world."

In colossal achievements it has surpassed the works of antiquity.

In constructive work of all kinds the American nation has taken the lead, holding her Light of Liberty and Peace high above sordid jealousies and selfish desires, setting the whole world a worthy example of true brotherhood and co-operation. Justly we may be proud that we are Americans.

For another great thing is to be done—there is to be a true "Uniting of the Union." A great shining band of brotherhood is to be stretched across the continent, from coast to coast, state to state, city to city, linking the hearts of all true Americans still closer together.

The Lincoln Highway—continuous, connecting, improved—a road of beauty and comfort—Your Way and My Way.

Lincoln could have no more appropriate—no more enduring—tribute.

You can share—you can help in the building of this glorious memorial.

Do it—send five dollars to—

The Lincoln Highway Association

Dime Bank Building, Detroit, Michigan

Send an additional dollar and get a pair of Lincoln Highway pennants for your car.

You cannot run your car with any old air pressure in the tires and expect the tires to last.

Tires are built to withstand a definite and specified air pressure.

You can only get maximum service when you inflate them to the exact air pressure needed, and maintain that specific pressure at all times.

SCHRADER



ONE DOLLAR

invested in the purchase of a **SCHRADER UNIVERSAL TIRE PRESSURE GAUGE** will save you hundreds of dollars for new tires.

For Sale by Tire Mfgs., Jobbers, Dealers, Garages or

A. SCHRADER'S SON, Inc.

783-791 Atlantic Ave.

Brooklyn, N. Y.



Model T Runabout \$500

Model T Touring Car 550

Model T Town Car 750

With Full Equipment f. o. b. Detroit

FORD MOTOR COMPANY

Detroit, Michigan

NO MAN IS RICH ENOUGH

to afford a cheap Plug in his motor. A poor spark requires a richer mixture and more gasoline. Cheap Plugs, with their cracking Porcelains or oil-soaked mica, lose half the current.

20 YEARS ON THE MARKET



MILLIONS ARE SPENT TO ADVERTISE PLUGS

The millions of delighted users of the **HERZ PLUG** are our advertisement

Buy HERZ PLUGS

They will prove the best investment of your life, one that will bear rich interest in

Smaller Gasoline Bills

ASK YOUR DEALER

HERZ & CO., 245 W. 55th Street (Just off Broadway.) New York

It's hot work pumping tires this weather!

BUT NOT THIS WAY

Nothing spoils a summer day's motoring so quickly as pumping up a tire by hand. Hot sun—you playing jumping-jack with the pump handle—perspiration streaming down your face. It's about the hardest job you ever tackled, isn't it? You can get your motor to pump your tires for you if you simply harness it to a

MAYO SPARK PLUG PUMP

Try One Free on Your Car for 30 Days



Instantly attached by substituting for any convenient spark plug—Pumps pure, fresh air only—Made with metal rings like your motor, and will last as long—inflates largest tire in from 2 to 4 minutes—Weight 2½ pounds—Complete with 12 ft. of hose and connections.

Price \$10.00

Mayo Quick Detachable Spark Plug, \$1.50 Extra

Mayo Mfg. Co.

55 East 18th Street
CHICAGO, ILL.

Insist on the Genuine

V-Ray Spark Plug

This Trade Mark Is
Your Guide →

Spark plug efficiency is best represented in V-Rays. They are positively impervious to heat or oil.



Porcelain
Type

\$1

"MIKA"
Type \$1.25

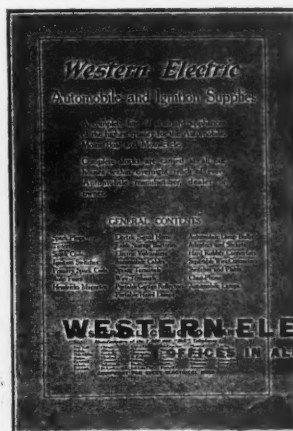
**More Power
on Less Gas**

good ignition all the time
and a plug that will out-
last your car.
Sold with a *Guarantee* by all
good dealers, but *insist* on the
genuine.

**The V-Ray Co.
Marshalltown, Iowa**

Dealers
All Jobbers

This Is the Catalog You Need



*These are the main distributing
points. Write to the one most
convenient.*

Western Electric Company

Manufacturers of the 8,000,000 "Bell" Telephones

New York	Atlanta	Chicago	Kansas City	San Francisco
Buffalo	Richmond	Milwaukee	Omaha	Oakland
Philadelphia	Savannah	Indianapolis	Oklahoma City	Los Angeles
Boston	New Orleans	Cleveland	Minneapolis	Seattle
Pittsburgh	Houston	Cincinnati	St. Paul	Portland
St. Louis	Dallas	Denver	Salt Lake City	

EQUIPMENT FOR EVERY ELECTRICAL NEED

Member Society for Electrical Development.

"Do it Electrically"



SPLITDORF MAGNETOS—low and high tension—are made in a wide range of models for all manner of work and they'll give your motor more power—make your motor run smoother and quieter than will any other make, and, equipped with one, you can always start your engine on a quarter turn.

We'll exchange your present magneto of any make on a liberal allowance basis for an up-to-the-minute **SPLITDORF** low or high tension.

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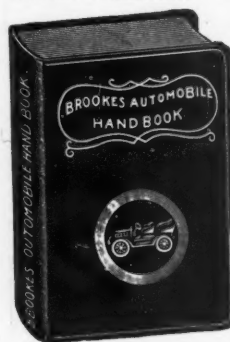
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are specially built with a full knowledge of the exacting requirements of automobile service. They are designed for continuous reliability and like all other Weston Models, are constructed with the most conscientious regard for the service for which they are intended.

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No. 200

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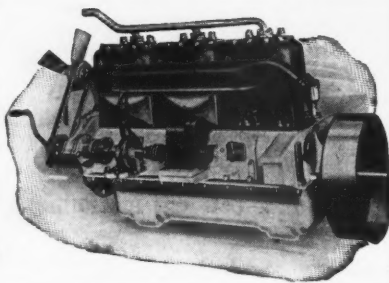
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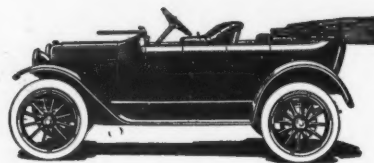
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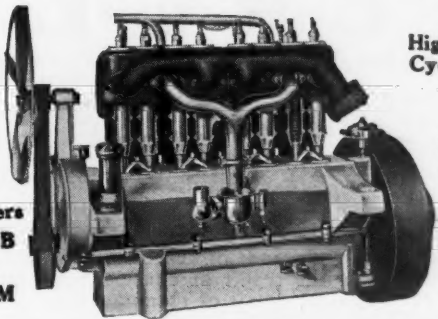
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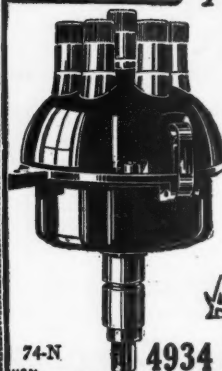
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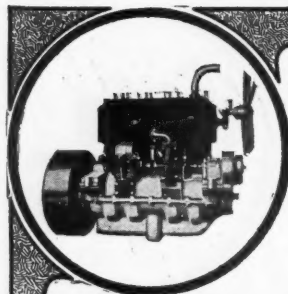
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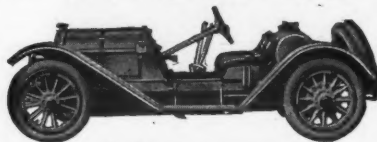
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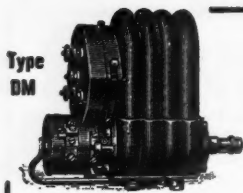
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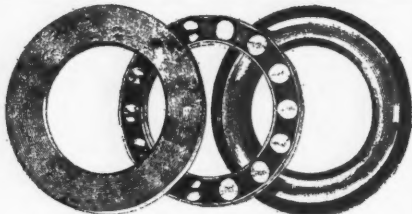
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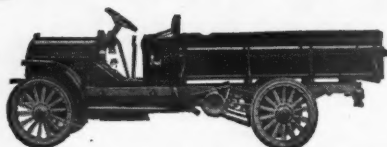
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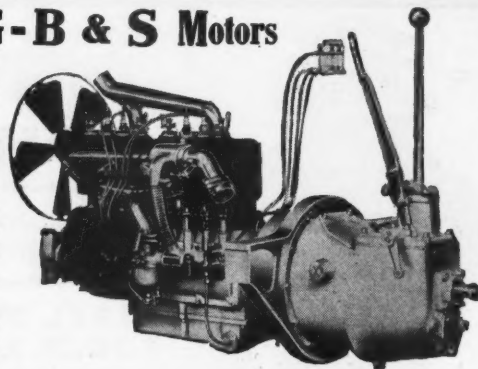
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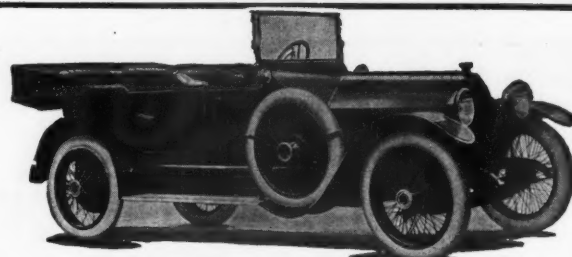
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SMOOTH—QUIET—POWERFUL
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Other Models \$1600, \$1700, \$1900, \$2000

Write for full particulars and catalogue

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Continental 6 P motor, 48 H. P. Bosch Ignition. Brown-Lipe 4 speed forward transmission. Spicer Universal joints. Timken full floating rear axle. Timken front axle with Empico speedometer drive. Timken bearings throughout. Long radiator. One man top. Gemmer steering gear. Left drive, center control. Goodrich tires, 34 x 4 1/2. Electric starting, generating and lighting. 130-inch wheelbase. 3,600 lbs.

Two pass., \$2485; Five pass., \$2485; Seven pass., \$2535
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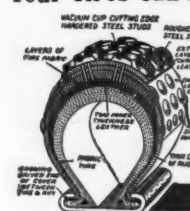
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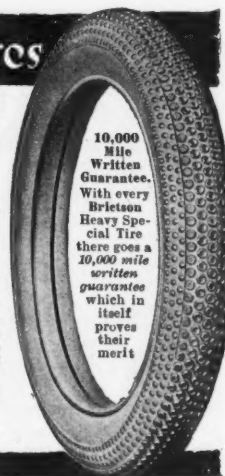
To remove all doubt that might arise in the purchaser's mind and to back up our statements—we will allow 10 days' free trial on the first set that goes into each town.

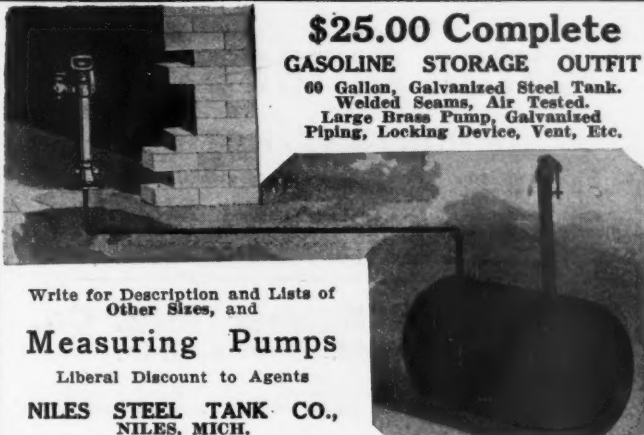
Your Tires Can Be Made Like This ➔



If you are not in need of new tires and the fabric in your present tires is still good—we can rebuild them the Bricton Way—making them Puncture-Proof, Non-Skidding, Blowout-Proof, Rut-Proof, Oil-Proof, and Rim-Cut-Proof. Write today for full particulars, giving your dealer's name.

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\$25.00 Complete
GASOLINE STORAGE OUTFIT
 60 Gallon, Galvanized Steel Tank.
 Welded Seams, Air Tested.
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 ADJUSTABLE TO ANY LOAD

the shock absorbers that have made good on heavy and light cars alike. The adjustment feature found only on Coxajustos is the reason for their superiority. A simple twist of the wrist adjusts them to the load. There is a model especially for the Ford.

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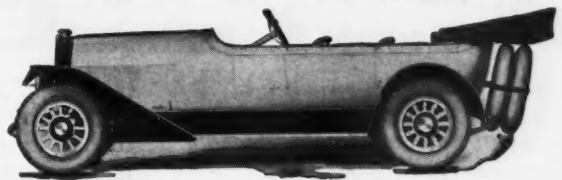
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Century Electric

a remarkably strong proposition for dealers. Our four page ad. in this paper, issue of May 28th, gives some facts and we invite you to write for it.

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Rated at 25 horse power—develops 96 horse power. Four cylinders, 4 inch bore and 8 13/16 inch stroke; 7 passenger; \$1,850, fully equipped.

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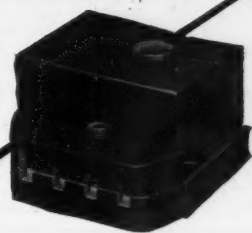
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This small Controller contains the dynamo control as well as the automatic switch that connects to and disconnects from the battery. This Controller can be used with any low voltage shunt wound dynamo, and maintains a constant ampere output. Complete data upon request.

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 FRICTION REDUCING MOTOR OIL

Maintains the correct lubricating body at any motor speed or heat

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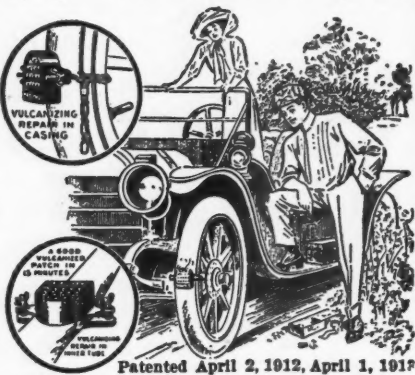
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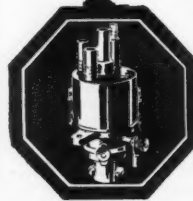
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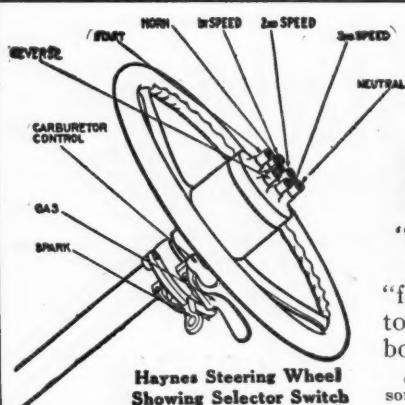
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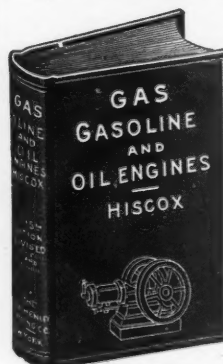
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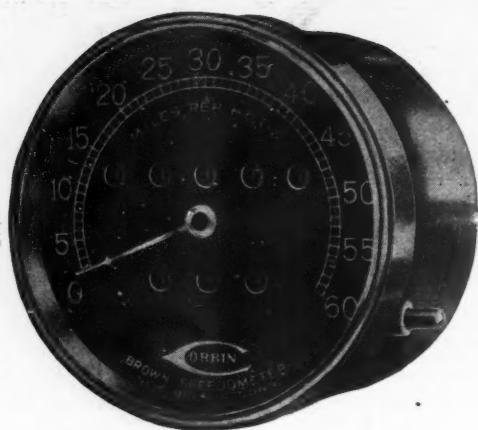
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Odd-Sized
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CHADWICK & TREFETHEN,

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Those who have tested both the *centrifugal* and *magnetic* speedometers unqualifiedly endorse the

CORBIN-BROWN

SPEEDOMETER

"The Speedometer of Absolute Accuracy"

They have seen the two types under actual working conditions and have had opportunity to fairly gauge their respective merits.

They will tell you that where the accuracy of the *magnetic* speedometer varies in accordance with the rise and fall of temperature the *centrifugal* speedometer remains totally unaffected.

They will point out the fact that electric influence—whether atmospheric or artificial—appreciably decreases the accuracy of the *magnetic* type, whereas the Corbin-Brown, by the very nature of its *centrifugal* principle, remains absolutely immune.

They will show further how the deteriorating effects of wear and friction so noticeable in the *magnetic* speedometer are reduced to a minimum by the simplicity and strength of the Corbin-Brown perfect mechanical construction.

They will place the shafting of the one against the shafting of the other and prove to you that the flexible shafting, an exclusive feature of the Corbin-Brown speedometer, is the strongest, most completely friction-proof shafting made, adaptable to all conditions of the road and durable under constant strain.

Experiment no longer! Before equipping with a speedometer, investigate the Corbin-Brown—specify it for your new car.

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The Corbin Screw Corporation

THE AMERICAN HARDWARE CORPORATION,
Successors

New Britain, Conn.

BRANCHES: New York Chicago Philadelphia

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The up-to-date use of wire wheels has brought the up-to-date Wire Wheel Cover.

GILBERT quality is supreme and GILBERT prices are nominal.

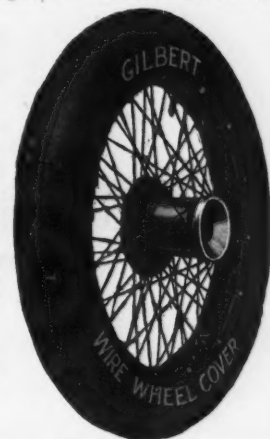
We also make an exceptionally fine line of Inner Tube Bags and Cases of fleece-lined rubber and other materials, leather magneto Covers, Steering

Knuckle and Universal Joint Boots and many other highly necessary articles made almost exclusively by us.

Our interesting catalog for 1914 contains a large number of surprisingly handy, useful and necessary articles, all at the right price and all the best that can be made. Get our booklet, but, above all, when buying accessories of the kind we make, insist on GILBERT quality.

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of your car,
disastrously skidding
on the slippery turn ahead—

You have neglected to put on Weed Chains. **You** anxiously view the slippery turn ahead and have *a mental picture of your car skidding into the school children.*

Stop nursing anxiety and coaxing calamity. For Safety's sake—
—for your own peace of mind fully equip your car today with

Weed Anti-Skid Chains

The Only Real Safeguard Against Skidding

Safety demands that all tires be equipped with Weed Chains. It doesn't require the gift of second sight to see why this is true. **Rubber slips—never grips.** Rubber will agree to anything the road has to offer. It is the weaker element. It slides on wet pavements like a cake of soap rubbed on the moistened hands. Rubber lacks the bite-and-hang-on ability to prevent skidding.

Weed Chains are attached without any jacks. You lay the chain over the wheel, with the hooks at the rear. Tuck the slack end under the front of the wheel. Run the car forward until the wheel clears the end on the ground. Draw the chains together, hook the hooks in the end links and *the thing is done.*

Weed Chains are diamond hard—many times harder than their opposing element the pavement or road. Wheels equipped with Weed Chains automatically lay their own traction surface. Friction is effected without affecting the tires. They grip without grinding—hold without binding. **No matter how muddy or icy the road,** they hold on like a bull dog, prevent side-skid and drive-slip.



Sold for **ALL** Tires by Dealers Everywhere

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Bridgeport, Connecticut

Manufactured for Canada by
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Wonderful!

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And the Overland costs only \$950.

That's something real to think about!



\$950 Completely
equipped

Prices f. o. b. Toledo, Ohio.

\$1075 With electric starter
and generator.

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Manufacturers of the famous Overland Delivery Wagons, Garford and Willys-Utility Trucks. Full information on request.

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Strength—safety, convenience—economy, beauty and practicability go hand in hand with the *wire wheel* to such an extent that in a few years' time the equipment of an automobile with wooden wheels will stamp such a car as out of date.

HOUK DETACHABLE WIRE WHEELS are the best of their kind, best in design, supreme in strength and durability. Our production is in shape to accommodate the requirements of American automobile manufacturers promptly—and in any quantity.

Guaranteed for 3 years.

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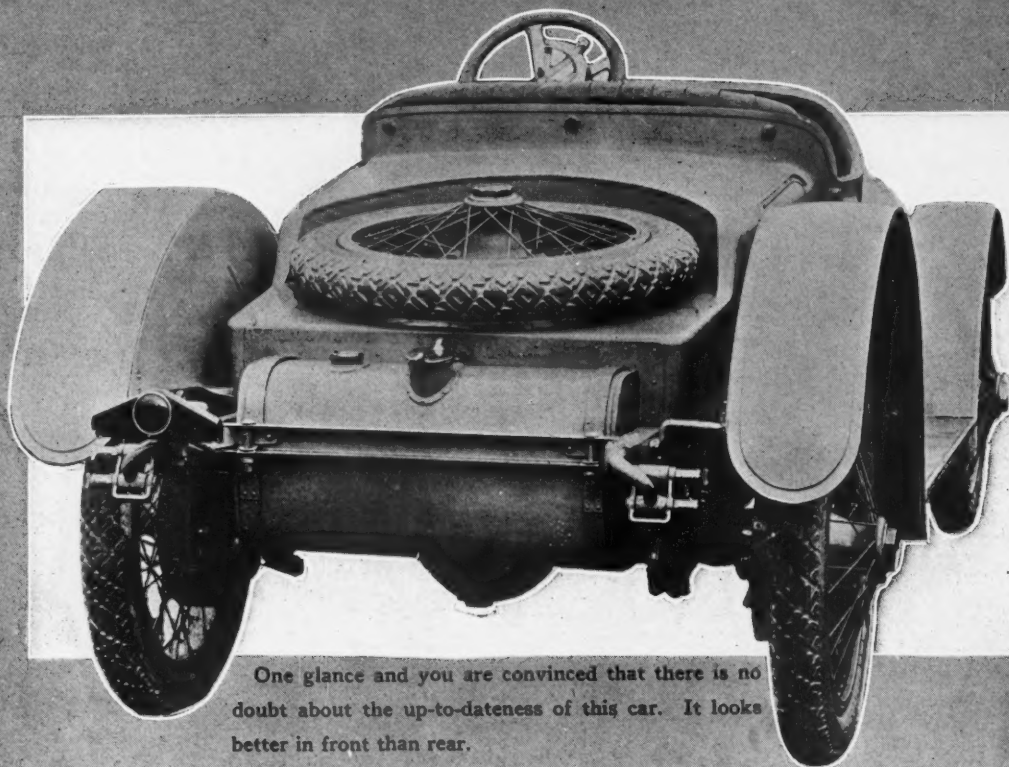
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1794 BROADWAY, NEW YORK

1700 ELMWOOD AVE., BUFFALO

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Buffalo - N.Y.*



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